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Spreckels SUGAR BEET Bulletin

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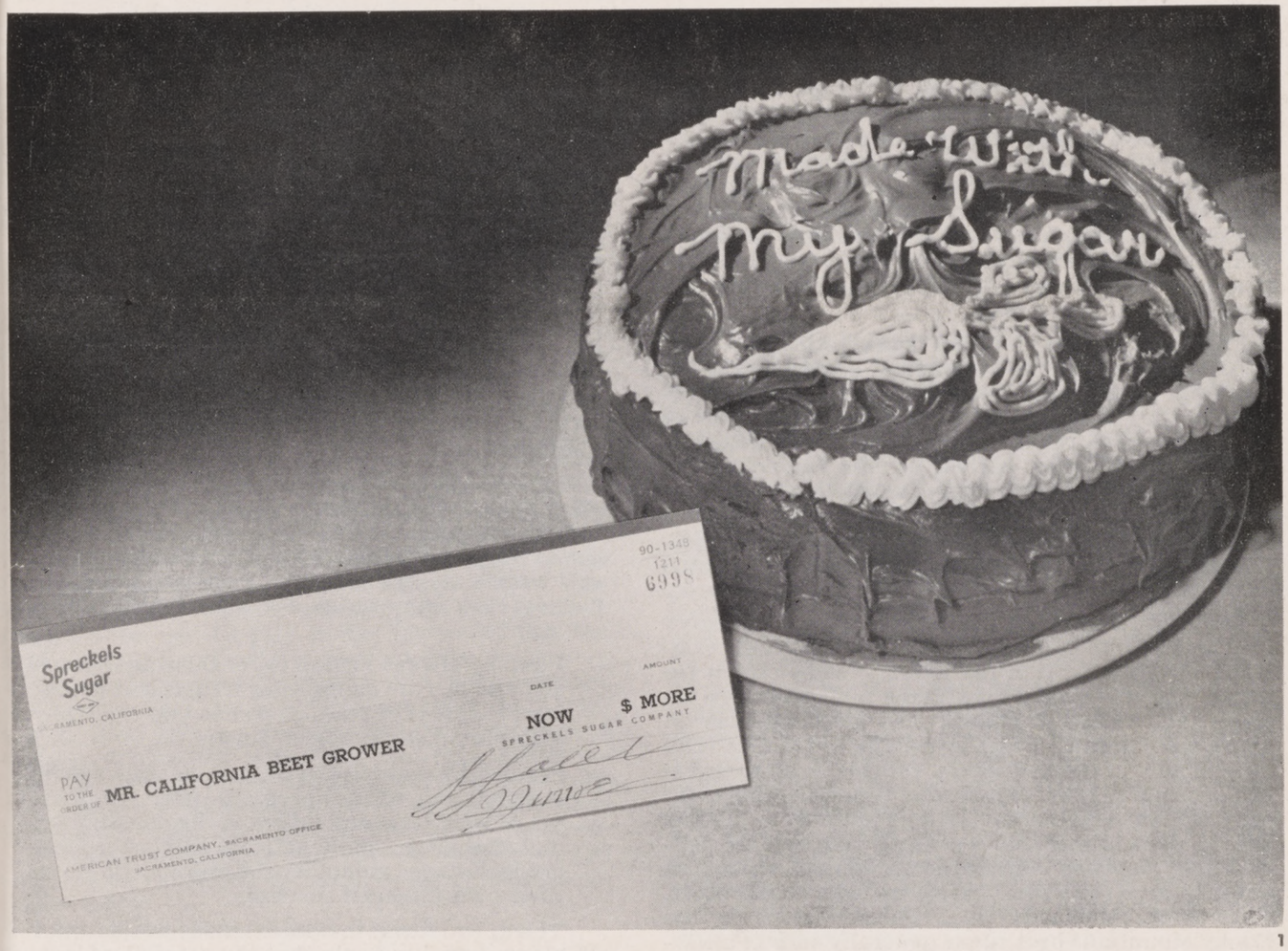
SPRECKELS SUGAR BEET BULLETIN



1

EAT YOUR CAKE AND HAVE IT TOO

How? Simply by using sugar made from your own beet crop.
When you use your own sugar, you receive

HIGHER PAYMENTS FOR YOUR BEETS

That is why the sugar you grow should be used in your home, your labor camp, your community (see page 2)

Vol. XV JANUARY - FEBRUARY, 1951 No. 1
PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

SPRECKELS GROWERS PROFIT BY BUYING THE SUGAR THEY PRODUCE

By B. H. BENIDT

Assistant to the President, Spreckels Sugar Company

UNDER the sugar beet purchase contracts in use generally throughout the West, payments for beets are based on the net return for sugar sold by the company. It is obviously to the growers' advantage, therefore, that the net sales return of their respective companies be as high as possible. For each additional dollar obtained by California processors for sugar sold at price levels prevailing in recent years, growers receive about 75 cents and the company 25 cents, based on normal quality beets and average sugar extraction.

Figure it this way: A ton of beets testing 17% contains approximately 300 pounds of commercially extractable refined sugar. If the average net sales return of the company is 6.5c per pound, the grower receives $10.846 per ton of beets. If the average net return is half a cent higher, or 7.0c per pound, he is paid $11.968 per ton. From the extra $1.50 of net sales return on 300 pounds of extractable sugar in the beets, the grower is paid $1.122, or about 75%. A higher net sales return for the company means more money in the grower's pocket.

What is the average net return of the company? It is spelled out in detail in the Beet Purchase Contract, but, briefly, it is the average sales return for sugar sold after deducting taxes and insurance on sugar, and selling expenses. The sales expense on sugar sold close to home is usually much less than on that sold at distant points. Outside of an area encompassing roughly the eleven Western States, for example, our customers pay only part of the freight bill. In distant markets we must maintain at considerable expense adequate warehouse stocks in order to give the same service as local competitors. Throughout the area from Chicago west to the Rocky Mountains beet sugar generally sells at a lower basis price than on the Pacific Coast. All this means that in a typical mid-west market we may expect to realize 50 cents less per 100 pounds of sugar than for sugar sold, say, in Sacramento. In certain markets and at certain times the differential is even greater.

Our Sales Department is constantly striving to increase the quantity of Spreckels sugar sold in California but in spite of the fact that over eleven million bags, cane and beet, are consumed annually in this State, a considerable part of our production must be sold elsewhere, and in most areas at lower net selling prices. This, of course, reduces the average net sales return of the entire production, and diminishes the return to both the growers and the company.

One of our greatest sales problems is getting Spreckels sugar into California homes. There still exists a mistaken prejudice against beet sugar on the part of many housewives and retail grocers. The eleven beet sugar companies in the West are together combatting this prejudice through the advertising and promotional campaign of Western Beet Sugar Producers, Inc. You have doubtless seen some of the consumer advertising of this organization in your daily paper.

The California Agricultural Extension Service, through its Director, J. Earl Coke, has recently enlisted its Home Demonstration Service to acquaint California housewives with the fact that beet sugar is equally as good as cane.

Beginning in the fall of 1949, Spreckels Sugar Company added powdered sugar, superfine and cube sugar in one and two pound cartons to its line of products. We will soon be offering one pound cartons of brown sugar. With this complete assortment of fine-quality household sugars, the first to be offered by any beet sugar processor west of the Rockies, we are certain to have at least as much to offer the housewife and her retail grocer as the best of our competitors. We are supporting this offering with an advertising and merchandising campaign of our own, in addition to that of the Western Beet Sugar Producers, Inc.

Our beet growers can and should help in this sales effort. Every bag of sugar that we can sell in California, instead of in Chicago or St. Louis, increases the average net selling price of the company. As we said before, this means more money in the grower's pocket. How can you as a grower help? In several ways:

First, by always buying Spreckels sugar yourself and by convincing your friends and neighbors that it is of real interest to you that they also purchase Spreckels sugar.

Second, by making the grocers in your neighborhood aware that Spreckels sugar is a product of your farm and others in the community, and that they should actively support a local product whose monetary returns contribute to their own financial success.

Third, by letting the other trades people from whom you buy know that the amount of business you can do with them is directly dependent upon your own success as a sugar beet grower, which is in turn dependent upon the favorable sales of Spreckels sugar. Ask them to buy Spreckels and contribute to your success.

Fourth, by using Spreckels sugar not only on your own table, but in your labor camps and in all other farm kitchens where you have a controlling influence.

Retail grocers who have stocked our sugar are quick to admit that there is no better sugar, and that our new line is as attractively packaged and as complete in all essentials as our cane competitor. But to get grocers to stock Spreckels they must first be convinced that there is a real demand for Spreckels sugar on the part of their customers. It is certainly only reasonable that our growers, their families and friends should always demand Spreckels, the sugar they grow. It's just good business.

WIREWORM PROTECTION INCLUDED IN SPRECKELS PROCESSED SEED

By JOHN KENDRICK

Field Superintendent, Spreckels Sugar Company

LINDANE is the common name applied to the technically pure gama isomer of Benzene hexachloride. Benzene hexachloride has other isomers, but it is just this one, in the purest form obtainable, that is termed lindane. Isomers, incidentally, are chemical compounds having the same elements in the same proportions, but demonstrating different physical properties.

There are many uses for benzene hexachloride and particularly for the gama isomer. The use in which beet growers are most interested is wireworm control, and for this particular job, lindane excells. (See Spreckels Sugar Beet Bulletin, Vol. XIV, No. 1, p 3).

The Spreckels Sugar Company has been issuing lindane-treated seed from the Woodland seed station during the past year. The Sacramento-San Joaquin Valley was selected as the area for preliminary studies in order to determine the demand for this service and the equipment necessary to offer the service.

For the 1951 crop season alterations and changes have been made in equipment and procedure that should facilitate the handling of such specially treated seed. In the past it was requested that the seed stations be given two weeks notice for issuing lindane-treated seed. While such a long advance notification may no longer be required, it is suggested that growers desiring lindane treated seed discuss the matter with their fieldman sometime prior to planting to assure themselves of a supply. The reason for early notice will be self evident when some of the storage features of lindane are discussed.

Growers considering the use of lindane-treated seed should be guided by the questions and answers which follow:

1. Do I need lindane-treated seed?

For about three out of four growers the answer would be no. It is doubtful that as much as one quarter of the acreage planted to sugar beets by Spreckels Sugar Company growers will be noticably affected by wireworm.

2. If I do need a control measure for wireworm, will seed treatment provide the most effective control?

No, the most effective control can be obtained by a soil treatment with benzene hexachloride wherein 100% control is possible. However, when cost is considered, soil treatment is quite expensive with normal application methods. Dangers of taste being carried over into edible crops (tomatoes, potatoes, carrots, etc.) that may succeed sugar beets is a danger, particularly where the less expensive, impure materials containing other than the gama isomer of benzene hexachloride are used. Seed treatment with lindane provides excellent protection for the one crop. Kills as high as 90% have been obtained with seed treatment, and the taste hazards are greatly reduced. Though control is less permanent with treated seed, the one crop is well protected and near perfect stands can be expected.

3. What will control with lindane-treated seed cost me?

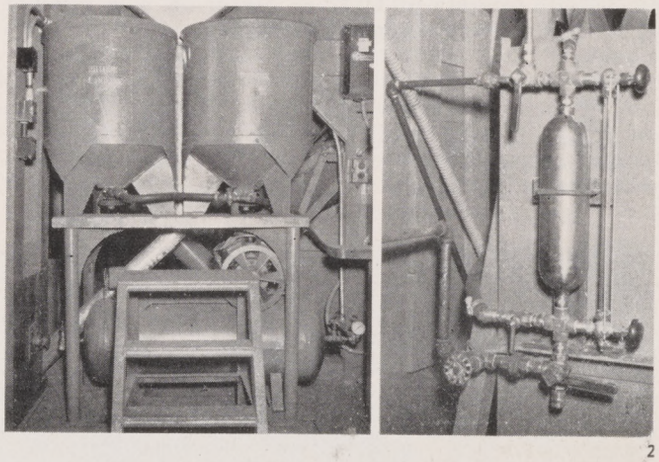
The actual cost per acre will depend upon the rate of planting. Normally, control of this nature should not exceed fifty cents per acre. Thirty cents per acre will be the cost for the average farmer.

4. Can I treat the seed myself?

Yes. The materials are readily available at most farm suppliers and you can treat your own seed at a slight saving to yourself. It is important to remember, however, that protection is only as good as seed coverage, and that the Spreckels spray method excells in this detail. It would be wise to discuss the problem with your fieldman to be certain of using the correct amounts of the proper material.

Lindane cannot be applied to all processed seed as is Phygon, because of its detrimental effect upon germination when the seed is stored for periods of time extending beyond four months. For periods less than four months, the effect of the chemical seems to be negligible. However, it was deemed judicious to issue lindane-treated seed as freshly treated as possible. Similarly it is not possible to accept any returns of this seed from growers.

The problems involved in rendering this service seriously upset the processing schedule last year and it was essential to make several changes in the seed station. These changes have been made, and include a 10,000 pound bulk capacity for storing processed seed, an additional mixer-agitator tank for a Phygon and lindane mixture, installation of an air compressor to spray materials onto seed, and a general increase in the flexibility and capacity of the station. Because spray application requires the use of a paste form of lindane rather than the conventional dust, the California Spray-Chemical Corporation formulated a suitable lindane paste which will be used in the 1951 season. The use of paste in a spray treatment assures a complete and uniform coverage of seed, and likewise insures growers of maximum wireworm protection within the limits of seed treatment.



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LEFT—Two agitator-tanks have been provided so that seed treatment can be immediately changed from Phygon to Phygon-Lindane.

RIGHT—This metering device is the heart of the new spray-treating system. Solution is accurately measured and sprayed onto the seed.

STATE DEPARTMENT OF AGRICULTURE ACTS IN LEAFHOPPER EMERGENCY

By H. M. ARMITAGE
Chief, Bureau of Entomology
California State Department of Agriculture

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DURING the past two or three years the Department of Agriculture has seemed to be losing ground in its efforts to control the beet leafhopper. This situation has been attributed to a long series of dry years favorable to Russian thistle which in turn has been responsible for the production of tremendous numbers of leafhoppers.

Conditions during the past spring became critical, with exceptionally heavy losses on the part of growers of early table tomatoes in Fresno, Madera and Merced counties. On their request to the Joint Interim Legislative Committee on Agriculture and Livestock Problems, $250,000 was made available to the Department to carry out emergency control measures which would be of equal benefit to the sugar beet industry.

The emergency measures as recently completed were directed against the winter generation of leafhoppers which had developed on this extended acreage of Russian thistle, particularly in the area along the western side of the San Joaquin Valley from Pacheco Pass south to and including Wheeler Ridge. These measures were timed to destroy leafhoppers in all active stages of this generation before they had an opportunity to move into the foothills where they normally over-winter.

In carrying out these emergency measures a total of 562,000 gallons of DDT in diesel oil was applied to 140,000 acres of thistle as follows:

County	Acres	Gallons
Kern	62,999	251,995
Kings	41,475	165,900
Fresno	27,249	108,995
Merced	3,299	13,197
San Luis Obispo	3,340	13,361
San Benito	2,277	9,110
	140,639	562,558

Application of the spray was at the rate of four gallons, or one and one-half pounds of DDT per acre. In this amount it was absolutely harmless to any livestock that might feed on treated plants or to any agricultural crops with which it might come in contact but was completely lethal to all active stages of the leafhopper.

Acknowledgment should be made here of the friendly cooperation of landowners and lessees in the control area who, though they have no direct interest in the problem, have permitted spraying of their range holdings—often at their own inconvenience in moving livestock to facilitate the work.

The application of these emergency measures posed somewhat of a physical problem due to the relatively short period—twenty days—in which they could be effectively conducted, and to the difficulty of maintaining a continuous supply of spray materials at the widely scattered points of application as required by plane operations. The spray materials were delivered ready mixed as needed at the 29 temporary airstrips from which spraying was carried out, the greater part of which was in the Kettleman-Lost Hills-Devil's Den area. Other areas included the Los Banos Hills on the north, the Tejon Ranch on the south and in the Carisa plains and Panoche Valley.

A total of nine planes were in operation at any one time. They averaged 1,000 gallons of spray material or 250 acres per hour per plane. Delivery of the spray materials was by tank truck, trailer and semi-trailer which were used as temporary roadside storage under a demurrage charge until emptied. A total of 184 tank loads of approximately 3,000 gallons each were required to complete the job.

The work was planned to start September 1st, but was delayed until October 2nd, since the leafhoppers failed to reach a stage in which they could be effectively sprayed until that time. This delay brought the spraying operations in conflict with cotton defoliation, which later held priority due to earlier commitment by the contractor. Fortunately, however, the weather remained favorable and the leafhoppers remained on the thistle until spraying was completed.

The County Agricultural Commissioners in the counties concerned, and members of their staffs, were materially helpful in gathering preliminary information on thistle distribution and survival, and on the stage and numbers of leafhoppers present. This was necessary in planning and conducting an effective control program. They also assisted in obtaining waivers permitting spraying on private property and in supervising actual operations in their

Photo by the author 4

29 FLIGHT STRIPS were established for basing spray-planes. The tankers shown hold 12,000 gallons of spray—enough for one day's operation of two planes.

SUGAR BEET PRODUCTION IN SAN JOAQUIN AND STANISLAUS COUNTIES

By R. BRUCE DUNCAN *and* DAN DIETER
Field Superintendents, Spreckels Sugar Company

SUGAR BEETS have long been an important crop in this area and are becoming increasingly important as the years go by. Because of this fact, it was felt that an article describing the common cultural practices in successful beet production for this area, was in order.

This area is large and as varied in its cultural practices as it is in its soil types. Space will not permit bringing out all of the individual practices of growers, but we will attempt to list the practices that are the most successful in beet production.

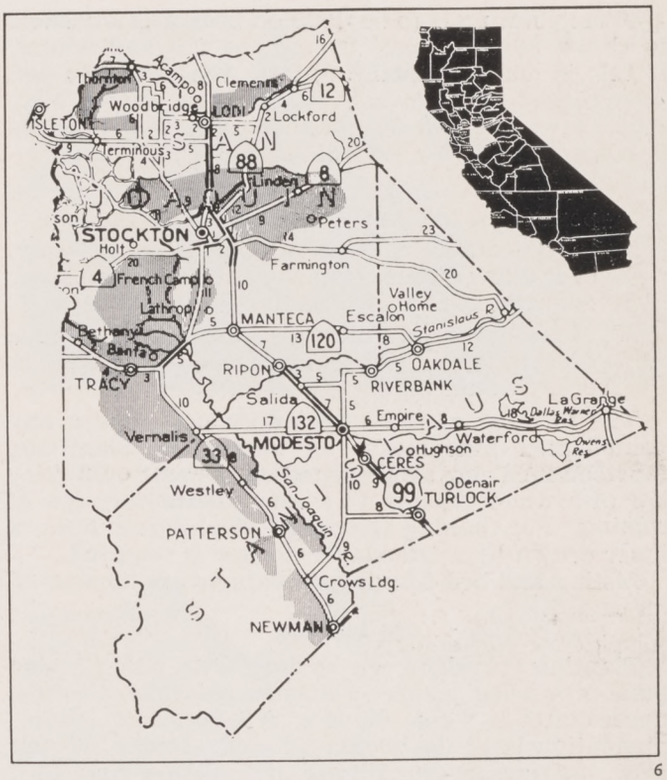
SEED BED PREPARATION

Seed bed preparation should start with a discing to chop up all crop refuse from previous crops. This should be followed by a deep plowing or chiseling to destroy any compaction or plow sole which might inhibit water penetration during irrigation later on during the growing season. Working the soil during the fall or early winter months is recommended as there has been no cultural tool developed that will do as good a job of breaking the clods or mellowing the soil as the alternate freezing and thawing that occurs during December and January. The importance of fall tillage cannot be emphasized too much.

In order for the grower to decide which system of planting is best suited to his particular case, earnest consideration must be given to the following:

1. Weed problem, with particular emphasis on water grass.
2. Row spacing of other crops grown with the same equipment.
3. Water penetration and the degree of fall on the land.
4. The type of harvester to be used and the availability of tractor power.

There are. of course, other considerations, but if the four listed above are given careful thought, the chances for choosing the wrong spacing are quite remote.



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SHADED AREAS indicate where sugar beets are now grown in the highly productive San Joaquin-Stanislaus County area.

A good reason for using 28 or 30 inch row spacing instead of other spacings (either greater or smaller) is because other row crops are planted so that the same tractor wheel spread can be used for all crops. For example, beans on 28 or 30 inch rows and tomatoes on 60 inch centers are the principal row crops in San Joaquin and Stanislaus County areas where beets are also grown. During the course of the season a great deal of wheel changing can be eliminated by adapting as many crops as possible to the same row width. **Distances greater than 30 inches have shown very marked reduction in yield per acre.**

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respective counties.

Checks made four days after application showed close to 100% mortality of the leafhoppers in all areas sprayed. A further high residual effect of the DDT is expected among any leafhoppers later moving from the floor of the valley through the sprayed areas to the foothills.

It will not be possible to determine the real results until the extent of curly top virus can be checked in susceptible crops in critical areas this next spring. However, it is expected that these emergency measures will have reduced this epidemic population of leafhoppers to near normal, where it can be successfully controlled by the usual winter spraying.

Photo by the author 5

IN RESTRICTED AREAS (in or near oil fields, ranches, etc.), State-owned ground rigs were used to supplement the airplane spraying program.

If the planting is to be done on beds it is advisable to throw up the ridges during the fall and winter. If this is done, by planting time the elements will have settled the beds to the extent that a good firm, moist seed bed will be obtained. Planting on beds is recommended for several reasons. They are:

1. Beds allow irrigation for germination during periods of low moisture content in the soil.
2. In the other extreme of too much moisture, beds allow drainage of excessive moisture away from the area in which the seed is planted.
3. Planting on beds allows rolling during periods of crusting of the surface soil when such a crust would inhibit emergence.

The forming of the ridges does not require any complicated machinery. In single-row plantings, fourteen inch shovels mounted on the rear cultivator bar of a wheel tractor do a very satisfactory job of ridging. For making the larger double-row beds, a lister drawn by a tracklayer tractor is required.

Listing and bed-forming operations are illustrated on page 7.

PLANTING

Planting on ridges can be done with either a sled planter or wheel planter, while flat planting of course necessitates a wheel planter. The primary recommendation is to use plenty of seed. Under 100 per cent satisfactory conditions of moisture and seed bed conditions, precision planting with low rates of seeding has been found to be satisfactory. However, under average conditions any planter that will sow from 4 to 5 pounds per acre on 30 inch single rows or 8 to 10 pounds on 20 inch plantings is satisfactory. From all practical standpoints it is more advisable to use 2 or 3 pounds more of seed per acre. It is nothing more than a cheap insurance policy insuring a stand. It's a lot more practical to hoe out surplus plants and have a full stand when thinned, than to wish for more plants when precision planting is not successful. Experience has proved year in and year out that in beet planting, a satisfactory stand is the basis of a successful crop. Why jeopardize that possibility of a good crop by trying to save a few pounds of seed per acre?

Planting dates for maximum yields in the San Joaquin-Stanislaus area are generally later than for other areas. In Tracy, March and April plantings often give excellent results and many growers have raised their best crops by planting late. In this area the feeling is that planting after the soil has warmed promotes rapid germination and emergence with the plants continuing to grow in mild to warm conditions, never being slowed by extreme cold and that maximum growth is the result. Planting too early means risking extremely cold conditions for germination and during the period through thinning, which in the opinion of a great many Tracy growers, causes a retarding of growth from which the plant never fully recovers.

In the San Joaquin-Stanislaus area, perhaps the most critical stage in securing a stand is the emergence period. Crusting of the surface is the bugaboo of the young beet seedling and can be controlled by rolling with a corrugated roller or culti-packer.

THINNING

The thinning process is, perhaps, the most important operation in beet production. It certainly isn't logical to put the time and effort necessary into securing a satisfactory stand and then have that stand jeopardized by a poor thinning job. Good thinning requires grower supervision, in addition to contractor supervision. The grower certainly has more at stake than the paid contractor who may be supplying labor for the job. Proper supervision during the thinning operation will protect the grower's stake.

Proper spacing and proper plant population are most important in securing good tonnage in beet production. Tests have proved that the most desirable stand is from 150 to 180 plants per 100 feet of row in single row spacings of 26, 28 or 30 inches. In 20 inch rows, the population should range from 100 to 130 plants per 100 feet of row.

Regardless of which row spacing a grower may prefer, plant population per acre should be his most important consideration and only a good thinning job will give him a satisfactory population.

FERTILIZING

This subject has long been one for long and heated discussion, but extensive trials and tests have proven on practically all of our soils in the area, nitrogen and nitrogen alone is the element to which beets respond. The amounts to apply may vary but applications of 75 to 125 pounds of actual nitrogen have been found to be most satisfactory. The amount of the application may be varied as to the previous crop. If it has been a nitrogen depleting crop the amount should be on the high side of the recommendation. If the beet crop is going into land that was recently in alfalfa or clover, 70 to 80 lbs. of nitrogen should be sufficient, under most conditions. On peat soils, a definite response to phosphate fertilizer has been experienced in trials carried on by Dr. Leach of the University of California and Mr. Torrey Lyons of the University Agricultural Extension Service. In sediment soils, no response to phosphate has been experienced.

IRRIGATION

Good yields are made by proper use of irrigation water just as yields are depressed by too little or too late irrigations. Beets require sufficient water for maximum growth and in one type of soil sufficient water may mean 5 to 6 irrigations, while on another type of soil it may mean 8 to 10 irrigations per season.

Seasonal variations in temperature will also cause variation in the amounts of water required. One of the most simple moisture tests is to take a shovel and dig down in the beet row, not in the furrow, and if the region in which the hair, or feeder roots are present in approaching dryness, the irrigation pump should be started without delay.

From the practical standpoint, the shovel test mentioned will reveal as much about moisture conditions as the successful beet grower needs to know.

In this area there is probably more damage done by too little water, than by too much. During this past season several growers in the Linden area have

(Continued on Page 8)

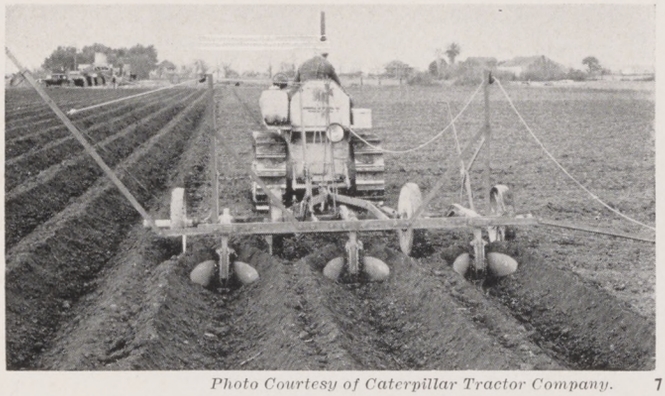
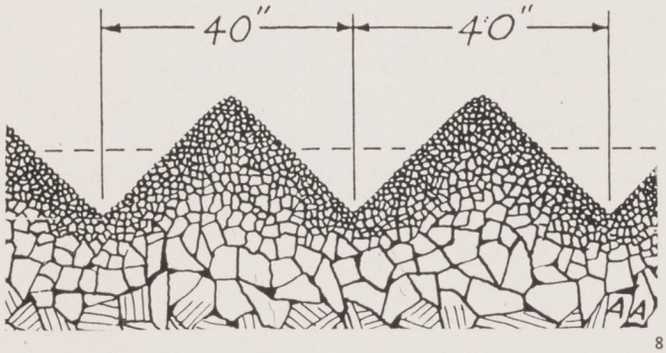


Photo Courtesy of Caterpillar Tractor Company. 7

Photo Courtesy of Deere and Company. 11



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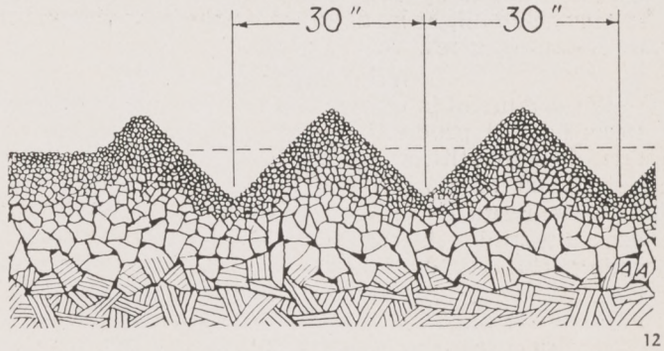
LISTING FOR 40 INCH DOUBLE BEDS is generally done with a 3-bottom lister drawn by a tracklaying tractor.



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LISTING FOR 30 INCH SINGLE BEDS can easily be done with a wheel tractor whose rear tool-bar carries three furrowing shovels.

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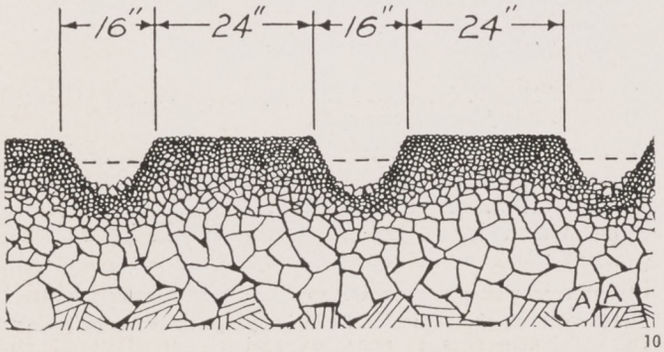
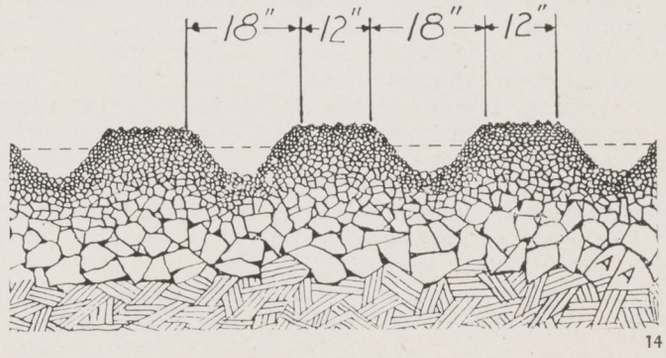


10

40 INCH DOUBLE BEDS require forming with a specially built bed former such as illustrated above.



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30 INCH SINGLE BEDS require no forming except rolling to flatten and firm the beds to a top width of about 12 inches.

SUGAR BEET PRODUCTION

(Continued from Page 6)

applied as many as 10 irrigations with very successful results. All of these fields averaged over 20 tons per acre.

It has been noted that in areas where water penetration is difficult, sugar beets have done better on single row ridges than on the wide and narrow 14x26 spacing so common in many localities. Many growers believe that having water on both sides of each row plus having less distance to penerate laterally is the reason. In many fields, where ground "seals up" or "slicks over," enough space between rows is provided to allow chiseling six to eight inches deep in the center of the furrow prior to each irrigation. The benefit from increased penetration brought about by this chiseling far outweighs any harm which might be done by disturbing some plants or breaking a few feeder roots.

WEED CONTROL

Weed control is one of the most expensive operations in beet production and many mechanical and chemical substitutes for the cultivator and hoe have been tried with varying degrees of success.

Pre-emergence spraying has been proved a success, and under the right conditions can substantially reduce the cost of the first hoeing. The timing and weather conditions are the important factors which control the success or failure of this operation.

In this area the weed which gives the greatest amount of trouble is water grass. It is usually in June when water grass starts to make its greatest showing and cultivation for its control should be accelerated rather than halted at that time. The use of single row ridges permits, during each cultivation, the use of tools which mulch the furrow and gently deposit some of this mulch on top of the ridge itself and in between the beet plants, covering young grass. Killing grass or other weeds in this manner is much to be preferred over the "man with a hoe" system.

The use of the T.C.A. has met with varying degrees of success in the control of water grass. As yet, it is felt that more trials should be completed before its use can be recommended. It seems to promise best results when applied for control of the late summer grass. On one stand of beets where it was applied at pre-thinning stage no control was obtained. The grass was definitely set back in its growth, but was not killed in sufficient amounts to justify the cost of application.

On the mechanical side of the picture, the tool which shows the most promise is the Peters "Byhoe" or spinner type of weeder. This tool has been tried on various soil types and beets of different growth stages, and it performed successfully under all conditions. It mounts directly under the "belly" of any standard wheel tractor, and is adjustable for the various row spacings. It incorporates the use of rolling coulters to protect the seedlings from being covered. Cultivation can be started as soon as the seedlings emerge enough for the operator to follow the rows. The seedlings are left on a band as narrow as 1¼ inches if desired, and the sides of the beds are very finely mulched and in a very desirable condition. This allows closer cultivation when the beets are very small, than is possible with other cultivator tools in use in the area at the present time.

The use of any one of the above practices alone for weed control is not enough, but the use of a combination of chemical—mechanical—hoeing practices can do much to reduce costs of weed control.

HARVESTING

In the fall, the place for most large tractors of the type required to pull a 2-row Marbeet harvester is in fields to be prepared for the following year's crop. Much has been written about the importance of fall work, and most fall work such as sub-soiling, chiseling, land planing and ridging, requires the use of the heaviest tractor on the ranch. With beets to be harvested, too often this machine is tied up on the 2 row Marbeet during most of the period during which fall work can be done to the best advantage. Here then, is another instance where 30 inch ridge planting must be given careful consideration. Recently there have come into the California beet growing picture several small single row harvesters which are either mounted on or pulled by wheel tractors. These small harvesters are proving to be quite efficient and capable of harvesting jobs equal to and, in many instances, superior to that done by the larger machines. The cost per ton of harvesting with these smaller machines ranges from $.35 to $.65 as compared to $.75 to $1.25 with the machines commonly in use at this time.

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MARBEET MIDGET harvesters lead in popularity within the San Joaquin-Stanislaus county beet growing areas.

If an investment of $5,500.00 for harvester and tractor is capable of doing a comparable job for which an investment of $14,000 for the large harvester and track layer tractor would be required, owning the small rig is surely justified.

The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers.
Mention of specific methods, devices or implements does not constitute an endorsement by the Company.

AUSTIN ARMER, Editor · 600 California Fruit Building · Sacramento, California

SPRECKELS SUGAR BEET BULLETIN

16

CAN YOU REPLACE THIS MAN?

The answer is yes — if you find labor scarce or want to cut cut thinning costs.

COLORADO
MICHIGAN
NORTH DAKOTA

and other states have mechanized the thinning of up to 47% of their acreage — with substantial benefits to their growers.

Vol. XV MARCH - APRIL, 1951 No. 2

PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

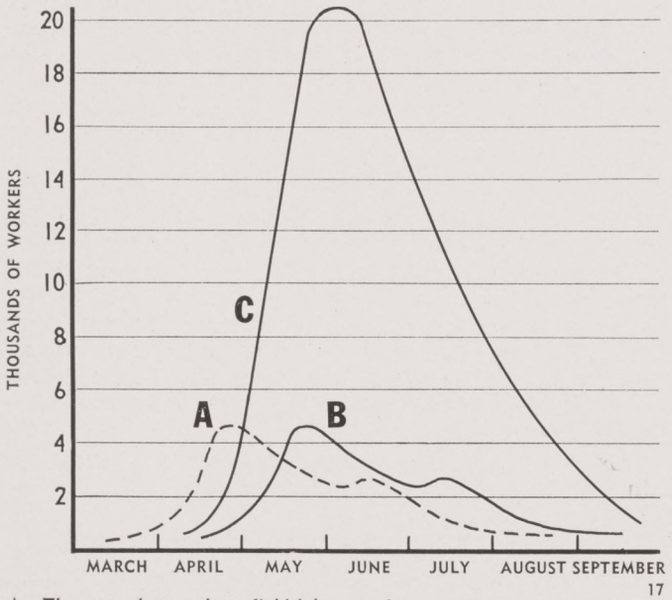
PREPARE FOR A SHORTAGE OF FIELD LABOR

By AUSTIN ARMER

Agricultural Engineer
Spreckels Sugar Company

WE can expect an acute labor shortage in California beet fields—from now on. These are the reasons:

1.) Cotton acreage is at an all-time high, and will demand much chopping labor.
2.) The past wet winter has delayed the beet crop so that beet thinning will conflict with cotton chopping.
3.) High wages in defense industry will attract field workers.
4.) The armed forces will take their share of field workers.



A—The normal sugar beet field labor requirement curve.
B—The probable 1951 sugar beet field labor requirement curve.
C—The probable 1951 cotton field labor requirement curve.
Note that the late season of 1951 has delayed the normal sugar beet labor requirement about three weeks, placing the 1951 sugar beet labor supply in direct conflict with cotton chopping labor needs.

These reasons are not guesses. Each reason represents a reduction in the 1951 beet field labor force which can be evaluated with fair accuracy. The Farm Placement Service of the California State Department of Employment, basic source of labor statistics in California, has just issued "Pre-Season Agricultural Report—1951." This report says in part:

"The farm labor supply is expected to be considerably smaller in 1951 than in 1950. With employment in non-agricultural industries, particularly manufacturing, increasing gradually throughout most of 1950, the demand was for professional and skilled workers, and work opportunities for farm workers, relatively unskilled in industry, were negligible. In 1951, jobs will be created by a gradual expansion of defense production, general acceleration of economic and industrial activities, and military withdrawals from the nonagricultural labor force. It is expected that the demand for semi-skilled and unskilled workers in nonagricultural industries will increase, not only in California, but in states customarily furnishing workers for California agriculture. This rising nonfarm demand will provide jobs for workers usually employed on farms.

"Among farm workers are those who were employed in defense industries in World War II, those with experience in trade and service occupations, skilled agricultural machinery operators, and veterans trained in operations and repair of radio, trucks, and other types of machinery used by military forces. It is assumed that many of these farm workers will resume industrial work in defense centers. In addition, there will undoubtedly be military withdrawals from the agricultural labor force. Seasonal workers lost to California agriculture will be of three types: California residents, those who normally migrate to California for agricultural work but become employed in defense centers at home or in other states, and those who migrate to California with the intention of working in agriculture, but are attracted by more remunerative employment in the industrial centers.

"Although agricultural employment averaged out substantially the same in 1949 and 1950, employment on farms in October, 1950, was 6 per cent below that of October, 1949. Nonagricultural employment in contrast was 6 per cent above the 1949 figure. In November agricultural employment was 6.5 per cent below the 1949 level, and nonagricultural was 7 per cent above. The trends of rising employment in industry and a declining farm labor supply are expected to continue, despite increased production and heavy labor requirements in agriculture.

"Shortages of farm workers increased in California in the latter half of 1950, and are expected to increase as 1951 progresses. A shortage of 75,000 workers at mid-October represents the maximum shortage expected for any one period of the year. Considering the labor lost already, and considering the augmented agricultural task facing California in 1951, this estimate seems conservative."

HOW YOU CAN PREPARE FOR A LABOR SHORTAGE

Thinning and hoeing of sugar beets will require stoop labor. While there are important mechanical aids to spring work, none of these can be expected to eliminate **all** labor. Therefore, a wise course would include these steps:

1.) Make early arrangements with your labor contractor. Keep in close touch with your Growers Association, your neighbor and your Field Superintendent.
2.) Be ready to go into your beet field at thinning time with mechanical aids such as cross-cultivators, down-the-row blockers or other thinning machines.

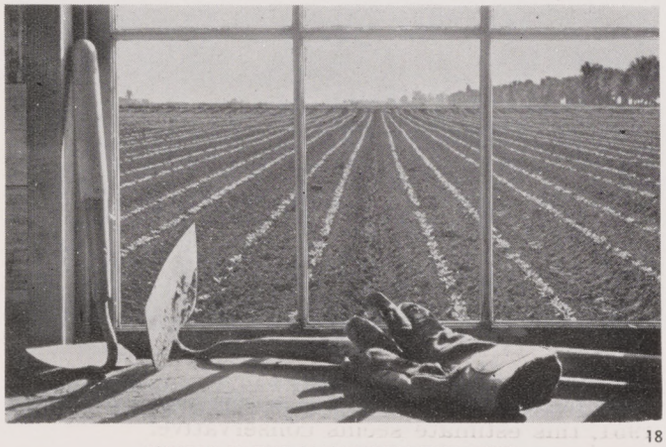
The Spreckels Sugar Company has made thorough tests on mechanical aids to thinning and hoeing (See SPRECKELS SUGAR BEET BULLETIN, January-February, 1950). Mechanical aids are recommended because **they can reduce or eliminate labor with negligible reduction of yield.** True, mechanically thinned

fields present a ragged appearance, and contain more double or multiple beets than are associated with skilled hand labor. But the saving in labor more than pays for possible yield reductions.

OTHER STATES HAVE MECHANIZED

California traditionally boasts about her leadership in mechanical harvest, yet she is at the bottom of the list in spring mechanization. Let's take a glance at the 1950 record. In Colorado, entire factory districts thinned more than 50 per cent of their acreage mechanically. Growers in the Red River Valley of North Dakota cross-cultivated 31,000 acres—47 per cent of all beet acreage in this area. One manufacturer of down-the-row thinners has orders for over 1,000 machines for 1951 delivery in Michigan and Ohio.

Why have California growers ignored these trends? The answer, voiced in unison by most growers, would be that there was always an abundant labor supply at beet thinning time—and that labor groups were employed in beet thinning to keep them in the community for later periods of heavy labor demand (fruit thinning, fruit and nut harvest, field crop harvest, etc.).



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WHERE IS THE MAN WITH THE HOE?

THIS picture and caption keynoted the SPRECKELS SUGAR BEET BULLETIN just two years ago. But instead of the field laborer losing his job because of Spring mechanization, other (and unforseen) causes have taken him out of the beet fields. Now the beet grower has little choice but to mechanize beet thinning.

THE LABOR SITUATION HAS CHANGED

The traditional Spring labor pool is now drying up. No longer can the beet grower count on abundant thinning and hoeing labor. With this warning, the beet grower can be expected to mechanize his Spring work with the same determination and resourcefulness that marked his mechanization of the harvest. How he will do it—what tools he will use—depends on his individual circumstances.

If his planting is on ridges, he will have to use down-the-row blocking or thinning tools. If his planting is on the flat, he may elect to cross cultivate, using his present equipment and avoiding the purchase of new tools.

TRENDS IN MECHANICAL STAND REDUCTION

In the pioneering stages of mechanical thinning, investigators stressed the importance of precise calculation of the block and gap dimensions as determined by stand counts. The late E. M. Mervine developed graphical methods of determining exact block widths and block centers as a function of beet-containing inches per 100 inches of row. Such accurate calculations proved difficult to apply in the field, however. It also became apparent that stands varied so much within a small area, that constant adjustment of the tools would be required.

More recent practices, based on experience rather than theory, employ the principle of random stand reduction. That is, a heavy stand is made into a light stand by one or more passes of a tool which cuts frequent gaps in the row. For example, a modern beet blocker would be set up to cut two inches and leave two inches, regardless of whether the stand was light or heavy.

After this preliminary thinning, the field can be hand thinned at a reduced labor requirement, sometimes limited to the first hoeing operation. If the original stand was unusually heavy, the machine may be used a second time. In emergencies, the machine thinned stand is allowed to remain without benefit of "touch-up" labor.

Most of the experimental work done by the Spreckels Sugar Company involve the use of the Milton Blocker and Weeder. In 1949, when Spring mechanization appeared to be practical and desirable, production of the Milton Blocker was undertaken on a small scale by the Shields Tractor Company at King City. Although California growers did not respond with heavy purchases, the Shields Tractor Company is still producing these machines on a limited scale.

Examples of three other stand-reducing tools are illustrated and described on page 12.

MECHANIZING TO REDUCE HOEING LABOR

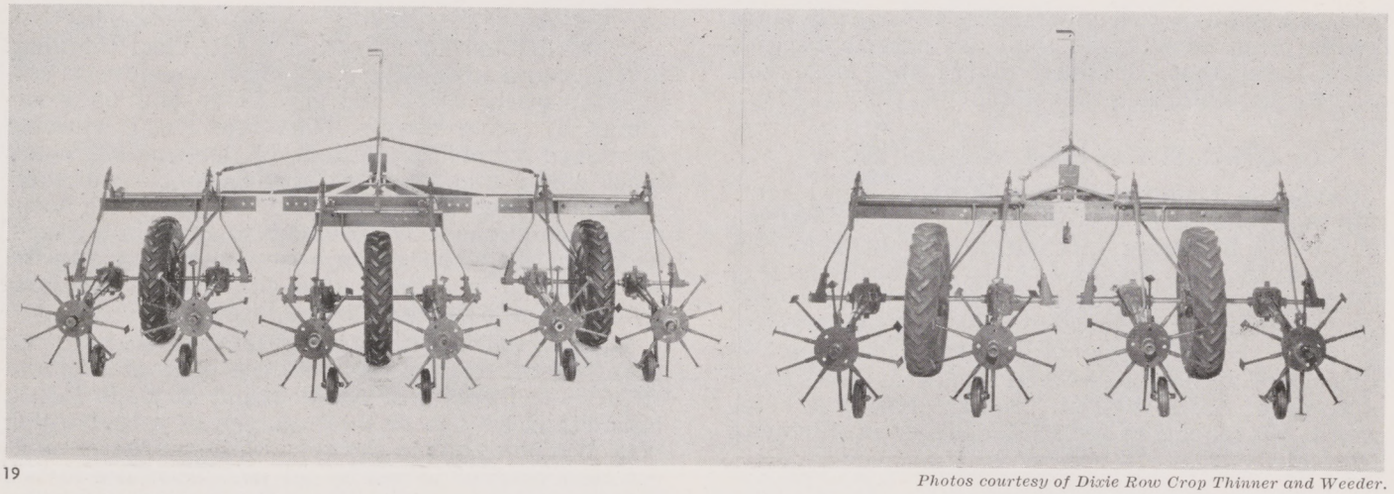
Thinning and hoeing, of course, go hand in hand. A sloppy thinning job, leaving many weeds in the row, will cost heavily in later hoeing effort. Thinning must be depended upon for destroying most of the in-the-row weeds.

Cultivation is the basic weed control operation. A well adjusted and well operated cultivator will control all weeds except those in the row, and occupying a band which should not be over 3 inches wide.

Recent advances in cultivating equipment have been made on the premise that a down-the-row cultivator can be made to control in-the-row weeds. Two principles have been followed. One is to throw loose soil into the row, covering small weeds, but not the larger beet plants.

The other is to reduce the band-width of undisturbed row by employing new standards of precision. In practice, the two principles generally combine to some extent.

Some recent advances in cultivation equipment are illustrated and described on page 13.



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Photos courtesy of Dixie Row Crop Thinner and Weeder.

DIXIE BEET THINNERS are favorites in Michigan and Ohio. They are available in four- or six-row models, and in models for flat or bed planting. Available from The Dixie Row Crop Thinner and Weeder, 3110 Factory Street, Dallas, Texas.

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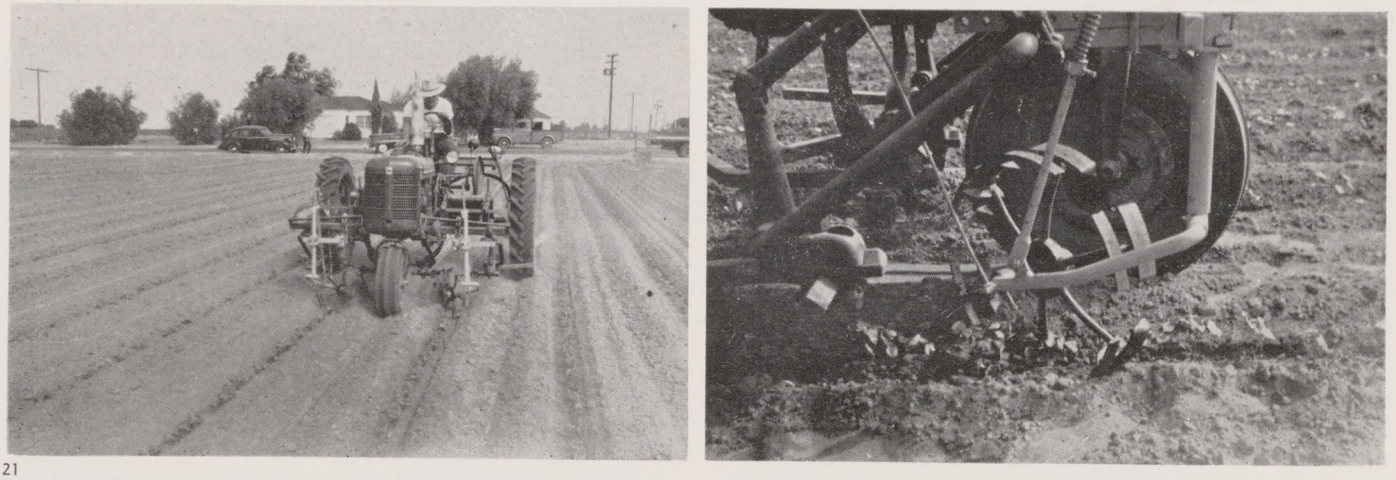
Photos courtesy of Eversman Manufacturing Company.

THE EVERSMAN Beet Blocker mounts on the front tool bar of a wheel tractor, and is power-takeoff driven. Both blocking and weeding heads are provided. A sample of the blocker's work is shown at the right. Made by the Eversman Manufacturing Company, Curtis at Fifth Street, Denver 4, Col.



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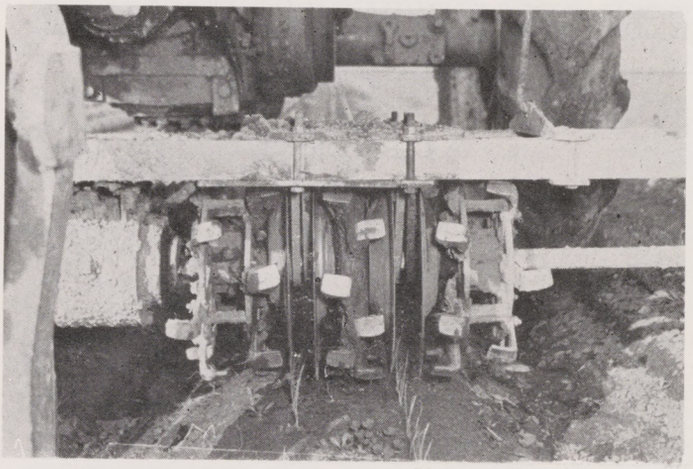
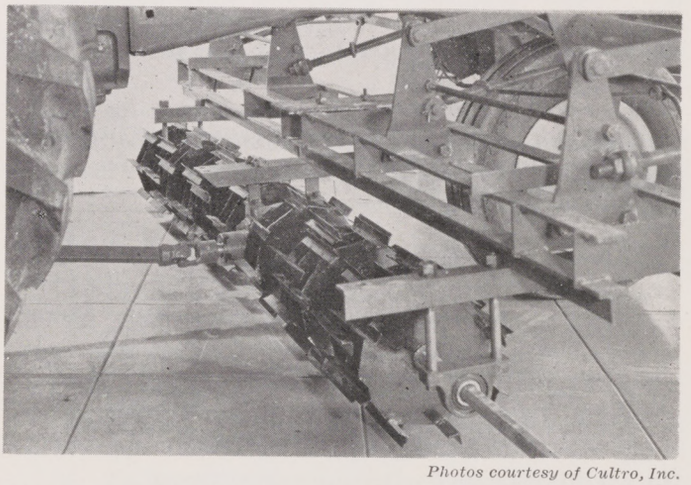
THE B & P Beet Blocker was originally developed for cotton chopping, but is widely accepted by Rocky Mountain beet growers. Its introduction into California was via the cotton fields, where these photographs were taken. Available from B & P Farm Tool Company, 201 North Arch Street, Little Rock, Ark.



22

Photos courtesy of Byron Peters.

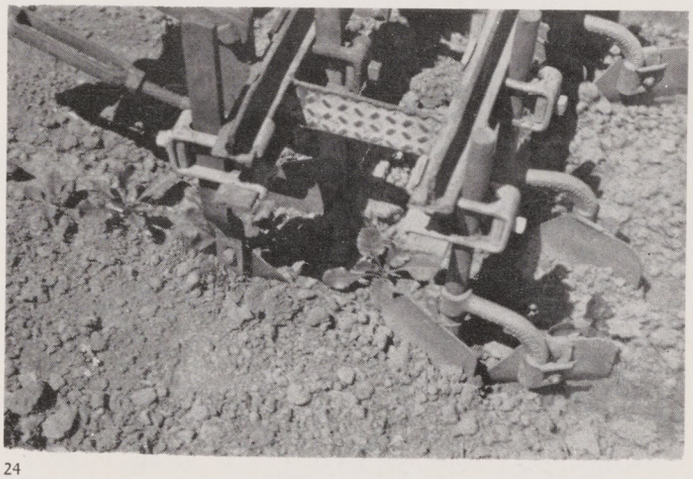
THE BYHOE is a development of Byron Peters of Lathrop, California. He is a row-crop farmer who succeeded in developing a cultivating machine that would sharply reduce hoeing labor. LEFT—the Byhoe in beet seedlings. RIGHT—the Byhoe in onion seedlings, showing rotating knives.

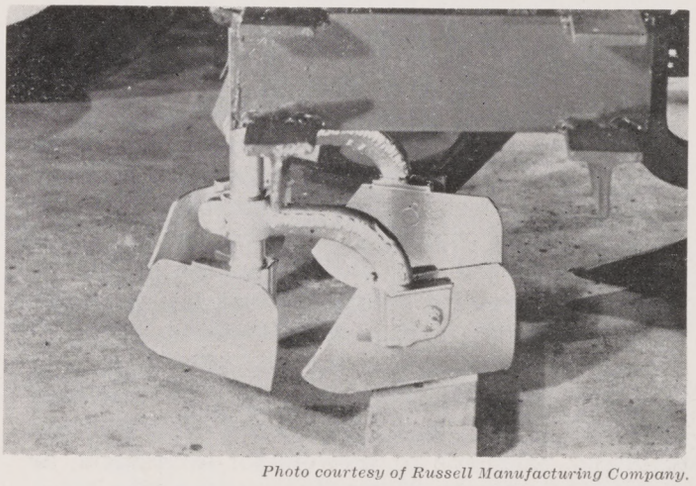


23

Photos courtesy of Cultro, Inc.

THE CULTRO Rotary Cultivator can change a crust into a mulch, while destroying weeds between rows and covering them in the row. Like the BYHOE, its rotor is power-takeoff driven. Available from Cultro, Inc., Yates Bldg., Boise, Idaho.





24

Photo courtesy of Russell Manufacturing Company.

THE RUSSELL WEED CONTROLOR consists of specially designed blades, of which the first pair scrape away weeds, while the second pair gather the mulched top soil and accurately replace it in the row, where small weeds are covered. Made by Russell Manufacturing Company, Caro, Michigan.

BEET SUGAR NOW OUTSELLING CANE IN PACIFIC COAST AREAS

by C. J. MORONEY

President, Spreckels Sugar Company

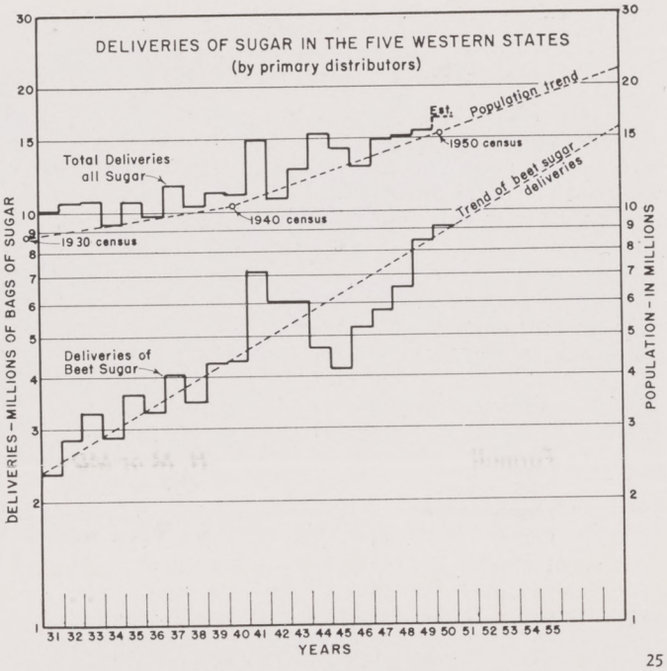
FOR the last two years deliveries of beet sugar in the Pacific Coast states represented the majority of total sugar deliveries by primary distributors in that area. In the five states of California, Oregon, Washington, Nevada, and Arizona, beet sugar has shown a steadily increasing proportion of the total deliveries, advancing from approximately 30 per cent in the early thirties to over 50 per cent in 1949 and 1950. In fact, the trend of beet sugar deliveries, both in California and the five western states as a group, is increasing at a faster rate than either the population trend or the deliveries of total sugar. These states comprise the principal home market for California-produced beet sugar.

The two accompanying charts show how the deliveries of beet sugar and total sugar in California and in the five western states compare with the trend of population in those areas.

Deliveries of beet sugar prior to World War II rose consistently in western markets. Between 1941 and 1944, deliveries increased above this trend, largely because of the availability of surplus beet sugar carried over from the very large crops of 1939 and 1940, and partly because the war restricted the movement of cane sugar from offshore points to the Pacific Coast.

During the next few years, beet sugar deliveries fell below the trend line because of the marked reduction in volume of production. In 1949, however, and again in 1950, beet sugar deliveries increased to approximately the pre-war trend line.

How long this favorable trend will continue will depend, to a large extent, on the future growth in population. It is possible that cane deliveries may stabilize at a level that will permit beet deliveries to expand with population. Future success in this effort will depend substantially on the assistance rendered by growers, both in maintaining year after year an adequate supply of beets to the factories and in actively promoting the sale of beet sugar in the communities in which they live. The resulting increased sales of beet sugar in the West will lead to higher payments to growers for their beets, as explained by Mr. B. H. Benidt's article in the January-February issue of Spreckels Sugar Beet Bulletin.



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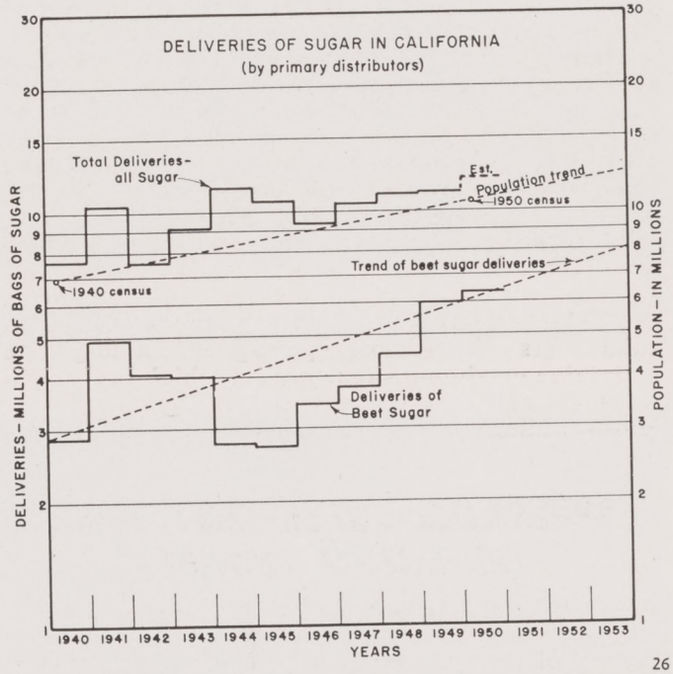
BEET SUGAR DELIVERIES are increasing in the five western states at a greater rate than population. The result is that beet sugar is outselling cane sugar in this area.



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IN CALIFORNIA, the sale of beet sugar shows the greatest upswing, both in relation to population growth and total sugar delivered. By helping to maintain high beet sugar sales, growers help themselves to higher beet payments.

DO YOU PLAN TO USE A MARBEET MIDGET HARVESTER?

GROWERS who contemplate harvesting future crops with the Marbeet Midget beet harvester should acquaint themselves with certain basic characteristics of the machine.

The Midget will attach to most makes and models of wheel tractors, but only those best suited to the harvester's operation. As a guide to prospective users, we present a list of makes and models which will accommodate the Midget. This list is complete—**no other tractor can be used.**

Make	Model
Allis-Chalmers	WD
Case	DC or SC
Farmall	H, M or MD
John Deere	AW or GW
Massey Harris	44
Oliver	70, 77 or 88

Any of these tractors must be equipped with adjustable tread front axle, hydraulic pump and long right-hand rear axle shaft.

ROW SPACINGS ACCOMMODATED

The Marbeet Midget will operate on any **evenly spaced** rows from 20 to 32 inches apart, either flat or on beds. Do not plan to use a Midget on double-row beds or unevenly spaced flat planting. Some growers have tried it in special cases and succeeded. But, as a general rule, such operation is impossible.

There is no ideal row spacing. In flat planting, equally good results have been obtained with row spacings of 22 in., 24 in., 28 in., 30 in., and 32 in. Operation in 20 inch rows is satisfactory, but large beets may be broken by the tractor wheels, and wider spacings are therefore preferable.

HEAVY STANDS HELP

The Midget is limited in the size of beets which can be handled. Beets weighing over 7½ pounds each are apt to jam in the topper. For this reason, the Midget operates best in heavy stands of medium sized beets. Since close spacing at thinning time maintains maximum sugar per acre, high beet population becomes doubly desirable to the user of the Marbeet Midget harvester, and should be anticipated at thinning time.

SPRECKELS AGRONOMIST JOINS EXTENSION SERVICE

F. J. HILLS, Agronomist for the Spreckels Sugar Company, has joined the Agricultural Extension Service of the University of California as Extension Agronomist. He will carry on the work of Wayne Weeks, who is now Regional Director of Extension for the San Joaquin Valley area.

Spreckels growers will remember Mr. Hills for his contributions to sugar beet cultural practices. Many of his findings have been published in the SUGAR BEET BULLETIN. The important work conducted by Mr. Hills will be continued as a part of the Spreckels Agricultural Research Program directed by Dr. Russell T. Johnson, Plant Breeder.

SUGAR BEET GROWING WILL BE A 4-H CLUB PROJECT

THE Agricultural Extension Service has inaugurated a new project program for members of 4-H Clubs. The project will embrace all steps in growing a crop of sugar beets.

Club members who enroll in this beet growing project in Spreckels' districts will sign the standard contract, receive the SUGAR BEET BULLETIN, and be eligible for the Honor Roll—with special mention of their 4-H Club membership. The Spreckels field staff will give personal assistance on cultural practices, record keeping, and other details of this important crop.

The Sugar Beet Project should be of special interest to 4-H Clubbers, since no other crop can be so accurately evaluated when harvested. Scoring of the individual can be accomplished with laboratory precision, free from the element of personal judgment.

Members of 4-H Clubs in beet growing counties can obtain score sheets and other information from their Farm Advisors' offices. An outline of the Project, as presented by the Extension Service, follows:

"The purposes of the 4-H Sugar Beet Project Program shall be:

1. To afford opportunity for farm boys and girls to acquire greater knowledge and to develop skills in the production of sugar beets and beet sugar.
2. To increase the economic per-acre production of sugar beets through the use of improved cultural practices.
3. To teach the value of careful record keeping.
4. To acquaint 4-H club members with the business contracts commonly used in sugar beet farming.
5. To provide contacts with leaders in the industry.
6. To permit wider participation in all local, state, and national 4-H Club activities by farm boys and girls who are interested in field crops.

"In order to qualify as a sugar beet project club member, each boy or girl will be required to:

1. Sign a contract with the sugar company; and also have a written contract with his father or other landlord covering leases, and other necessary agreements.
2. Operate a carefully measured acreage of land devoted to the growing of sugar beets.
3. Do or closely supervise all work connected with his sugar beet project.
4. Keep careful up-to-date records of all dates, time, costs, and receipts involved in his sugar beet project.
5. Attend, and participate in, tours, inspections, demonstrations, or other events planned by the club.
6. Hand in a completed record at the completion of the sugar beet project. This record shall be in a report form supplied to him for that purpose, and shall contain the data mentioned above (4), together with a written story of his project experience."

NEW SUGAR BEET TECHNOLOGY BOOK TO BE PUBLISHED SOON

SINCE Lewis S. Ware's "Beet Sugar Manufacture and Refining" (published in 1906), went out of print some twenty-five years ago, there has been no comprehensive book on beet-sugar manufacture available in English. The need has become so great for such a work, that a cooperative manuscript has been written by authors drawn from all parts of the industry, under the editorship of R. A. McGinnis of the Spreckels research department. It will be published in June by the Reinhold Publishing Corporation of New York.

In scope, the projected book covers all phases of sugar-beet growing and beet-sugar manufacture. Of special interest to growers is the large section on sugar-beet agriculture, with complete treatment of cultural operations, irrigation, insect pests and nematodes, and plant diseases. Tare laboratory operations receive a full chapter, for the first time in print, and a chapter on beet storage problems marks another first appearance.

Special attention has been given to illustrations, and the text will be replete with photographs, diagrams and charts.

The authors include:

AUSTIN A. ARMER, Agricultural Engineer, Spreckels Sugar Co.

F. H. BALLOU, JR., Engineer, Spreckels Sugar Co.

M. J. BLISH, Supervisor of Organic Chemical Research, International Minerals and Chemical Corp.

L. J. BOOHER, Extension Specialist in Irrigation, University of California at Davis.

R. J. BROWN, Research Chemist, The Great Western Sugar Co.

W. H. BUCKINGHAM, Agricultural Superintendent, Spreckels Sugar Co.

ROBERT C. CAMPBELL, Dorr Co.

W. W. CONNER, Assistant to the Vice-President, Spreckels Sugar Co.

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ROBERT C. COTTON, Director of Research, Holly Sugar Corp.

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L. D. DONEEN, Associate Irrigation Agronomist, University of California at Davis.

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R. L. MOORE, Orchard Supply Co.

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T. J. NELSON, Packaging Technologist, California and Hawaiian Sugar Refining Corp.

WALTER J. NELSON, Staff Engineer, Celite Division, Johns-Manville Sales Corp.

A. A. NORMAN, Factory Superintendent, Spreckels Sugar Co.

L. P. ORLEANS, Research Engineer, Holly Sugar Corp.

I. A. RESCH, Factory Superintendent, Spreckels Sugar Co.

W. A. SARGENT, Warehouse Superintendent, Spreckels Sugar Co.

D. E. TELL, Engineer, Spreckels Sugar Co.

W. O. WECKEL, Chief Chemist, Spreckels Sugar Co.

E. T. WINSLOW, Bulk Sales, Spreckels Sugar Co.

Chapters include: History, Growing Sugar Beets (Seed production and Processing, preparation of the Seedbed, Planting, Weed Control, Thinning, Post-Thinning Weed Control, Fertilizer Application, Irrigation, Harvesting, Insect Pests, Nematodes and their Control, Plant Diseases and their Control, By-Product Utilization, Beet Receiving and Transportation), The Tare Laboratory, Storage of Beets, Preliminaries to Processing, the Diffusion Process, Fundamental Chemistry, First Carbonation, Second Carbonation, etc., Activated Carbon and Ion Exchange, Evaporators and Fuel Economy, Crystallization, Packaging and Storage, Special Sugar Products, Lime and Carbon Dioxide Production, the Saccharate Processes, the Pulp Drier, Waste Disposal and By-Product Recovery, the Boiler House, and Technical Accounting and Process Control.

The book will be approximately 500 pages in length, and its price will be announced later.

The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers.
Mention of specific methods, devices or implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.
AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

SPRECKELS SUGAR BEET BULLETIN

27

RESEARCH HAS RAISED SUGAR YIELD

An acre of sugar beets in California yields three times the sugar it grew twenty-five years ago

FEDERAL AND STATE DEPARTMENTS OF AGRICULTURE
UNIVERSITY AND INDUSTRIAL RESEARCH GROUPS
SUGAR BEET GROWERS AND PROCESSORS

Have cooperated in the research work that produced this dramatic increase.
See page 18

Vol. XV MAY - JUNE, 1951 No. 3
PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

RECENT DEVELOPMENTS IN SUGAR BEET BREEDING

By
JOHN S. McFARLANE, Geneticist
and
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Division of Sugar Plant Investigations
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USDA Photo 29 CHARLES PRICE, Agronomist

THE development of sugar beet varieties adapted to growing conditions in the Western States has been under way since 1918. A discussion of the early history of this breeding work and a description of the varieties developed by the United States Department of Agriculture were included in an article on sugar beet varieties on Page 22 of the 1949 issue of the "California Beet Growers Association Bulletin." For many years, primary emphasis was placed on the development of a curly top-resistant variety. This objective has been accomplished in the variety, US 22, and efforts are now being concentrated on the incorporation of other desirable characters such as high sugar content, non-bolting, downy mildew resistance, and single-germed seed into curly top-resistant varieties.

A COOPERATIVE APPROACH

The job of incorporating all of these characters into an adapted variety is not easy. Countless numbers of crosses and selections must be made before the right combination of characters is obtained. Promising, new strains must be thoroughly tested in the various beet-growing districts and seed-producing areas before they can be safely released as new varieties. This complex job can be most efficiently accomplished by the cooperative efforts of a group of research workers, rather than by the independent efforts of individual plant breeders.

In order to meet these objectives most effectively, the United States Department of Agriculture has established five sugar beet field stations in the Western States which are all either directly or indirectly working on breeding problems. These stations are located at Riverside and Salinas, California; Salt Lake City, Utah; Twin Falls, Idaho; and Corvallis, Oregon. Each new variety developed for the California grower by the U. S. Department of Agriculture represents the pooled efforts of research workers in each of these stations. The research groups at Salt Lake City and Twin Falls are most actively engaged in the development of strains of beets which are resistant to curly top, possess a high sugar content, keep well in storage piles, and have single-germed seed balls. Plant breeders at Salinas and Riverside are concerned primarily with non-bolting, mildew-resistance, and single- germed seed. Breeding stocks are exchanged among these stations and combined into varieties adapted to local conditions. Promising strains are sent to Corvallis where their performance as seed-producers is determined. Other research workers provide technical information on the virus causing the curly top disease and on the physiology of bolting.

USDA Photos 30

COMPARISON of the yields of US22 and Old Type at Shafter, California (under conditions of several curly top, 1949). US22 yielded 47.5 tons per acre and Old Type 1.5 tons per acre. Insert shows how the Old Type plot appeared before harvesting.

Without a cooperative approach, duplication of efforts result, progress is slower and costs are higher.

Financial assistance in this work is furnished by the Curly Top Resistance Breeding Committee which is an organization of the sugar beet companies operating west of the Mississippi River. All four of the California sugar companies are members of this committee and contribute substantial amounts to the support of the breeding program. As promising new strains of beets are developed, they are made available to the companies and to the State Experiment Station for widespread tests. Breeding stocks possessing valuable genetic characters, such as single-germed seed, are also made available to interested sugar company breeders for use in their programs.

RECENT PROGRESS

Although no new varieties have been tested thoroughly enough during the past year to warrant their recommendation for large-scale commercial plantings in California, results with a few new strains and breeding stocks will be of interest to growers.

Resistance to Bolting

Preliminary tests with newly-developed strains that are both non-bolting and resistant to curly top have been encouraging. In 1946, a non-bolting selection was made from the US 22/3 variety by the Spreckels Sugar Company in cooperation with the Curly Top Resistance Breeding Committee. Tests with this selection, which carries the government designation of SL 731, have shown it to be intermediate between US 22 and US 15 in bolting resistance and highly resistant to curly top. A similar seed lot, which carries the Spreckels designation of S2, has been increased by the Spreckels Sugar Company and tested in numerous locations. Dr. Russell Johnson has discussed the promising results with this selection on Page 48 of the 1950 volume of "Spreckels Sugar Beet Bulletin."

The improvement in bolting observed in this 1946 selection from US 22/3 encouraged us to make a second successive non-bolting selection. This new selection is known as C975, and was tested for the first time in 1950. Results of these tests show that it is equal or superior to US 15 and US 56 in resistance to bolting and that it approaches US 22/3 in curly top resistance. A marked improvement has also been made in mildew resistance. The seed supply was too limited to make adequate tests of its yielding ability, but preliminary trials at Salinas and Shafter have been encouraging. A sufficient seed supply is being produced to enable each of the four California companies to conduct widespread tests in 1952.

A variety with the curly top resistance of US 22 and the slow bolting tendency of US 15 and US 56 would have wide application in California. It would have particular value for fall and winter plantings in the San Joaquin Valley where curly top frequently causes serious losses in these early plantings. Such a variety could also be used in winter and early spring plantings in the coastal districts, especially if it possessed good mildew resistance. Whether or not C975 proves to be a commercial variety, adapted to widespread plantings in California, the knowledge that a non-bolting, curly top-resistant variety can be produced by selection within US 22 will speed up the ultimate development of such a variety.

High Sugar

Tests at Shafter during the past two years have given promising results with a new sugar selection from US 22/3. This selection was made in Utah, and carries the designation of US 35/2. In these San Joaquin Valley tests, it has produced a similar tonnage of beets to US 22/3 and has been about one per cent higher in sugar content. This past season, in a test at Shafter under conditions of severe curly top, it yielded 37 tons of beets per acre with 12.8 per cent sugar, whereas US 22/3 yielded 37 tons of beets with 12.0 per cent sugar. If tests now being conducted by the sugar companies continue to be promising, this new, high-sugar variety will be worthy of commercial trials in California.

Downy Mildew Resistance

Favorable weather conditions in the coastal districts during the late fall and winter have made 1951 a bad mildew year, and again emphasized the importance of this disease in reducing yields. Serious damage has occurred, not only in the susceptible US 22 variety, but also in the moderately resistant US 15 and US 56 varieties. Results obtained at Salinas show that our present varieties are highly variable for mildew resistance. As an example, plants have been found within the US 22 variety which are just as resistant as the variety, US 56. Breeding stocks have been developed by hybridization and selection which show only slight damage from mildew, whereas adjacent plantings of US 56 show 40 per cent infected plants. The job of incorporating this resistance into a commercial variety is now under way.

Single-Germ Seed

Great strides have been made during recent years in the mechanization of sugar beet production. Nearly all phases of the production process are now handled mechanically in California with the exception of thinning and hoeing. An important obstacle

(Continued on page 22)

USDA Photo 31

PLOTS are seeded at the Salinas station with this special planter with hydraulic lift. It can be detached to free the tractor for other work.

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RESISTANCE to downy mildew is developed in this humidified green house at Salinas. Here conditions are extremely favorable to mildew growth.

The Honor Roll for 1950

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Tom Okita	25.0	37.93	10,104
T. R. Nishimoto	5.0	37.40	13,146
Roy Rianda	9.0	37.30	8,648
Barlogio & Bernasconi	35.0	35.87	11,720
Botelho Bros.	10.0	35.84	10,456
J. H. Eveland	37.0	35.69	9,029
Franscioni, Griva & Son	30.1	35.64	11,235
Tamagni Bros.	52.5	35.46	10,806
H. G. Silveira	18.0	35.33	8,116
William D. Crinklaw	72.0	34.76	11,112
Lloyd Foster	17.5	34.63	10,214
Con Ferrasci	17.0	34.20	11,401
G. G. Guiberson	121.0	34.13	11,495
Coit Ranch, Inc.	38.0	33.90	10,122
Valley Farms	14.2	33.86	11,940
Meek & LeMaitre	138.0	33.75	9,551
G. G. Guiberson	66.0	33.53	9,717
United Farms Co.	47.0	33.40	9,630
K. L. Morris	128.0	33.35	7,704
Higginbotham Bros.	73.0	33.34	8,848
Kenner & Usrey	108.2	33.19	10,764
Tony Homen Jr.	50.7	33.10	10,529
Arnold Collier	24.0	32.83	9,389
Otto Burgdorf	24.0	32.76	8,426
E. F. Longeval	22.0	32.76	7,050
Fred Vosti	25.0	32.60	9,113
Bellone & Del Chiaro	36.3	32.56	10,583
Mary F. & E. E. Nutting	37.0	32.52	8,350
Ernest A. Ricotti	9.0	32.48	11,872
Chester M. Locke	12.0	32.45	8,541
Schween Bros.	31.8	32.40	9,367
Pacific Fruit Exchange	97.0	32.40	6,881
I. Hulbert	20.0	32.38	9,578
Richard Moore	70.0	32.23	8,657
Alfred Riva	29.5	31.98	10,133
R. G. Wood	149.0	31.98	10,086
Bruce Church & James Hughes	12.0	31.98	9,941
Donald Fong	56.0	31.89	7,972
Gabilan Packing Co.	38.5	31.84	10,412
R. Sargenti & Son	9.0	31.78	10,339
E. Bassetti	26.8	31.70	9,161
Joe Valenti	35.0	31.65	8,463
Taix Company	5.0	31.61	8,791
Dixon Dryer Co.	50.0	31.60	9,284
Gibson Bros.	6.0	31.57	11,681
A. & C. Scaroni	53.8	31.55	9,999
C. H. & Maria Ferrasci	58.3	31.54	9,380
Achille Ferrasci	63.2	31.49	9,175
Coit Ranch, Inc.	78.0	31.27	8,668
Wetzel Bros.	63.0	31.19	7,685
Alvin Noll	65.0	31.13	9,687
Toledo & Hernandez	115.0	31.10	8,888
Mary F. & E. E. Nutting	79.7	30.97	7,803
M. Carden	145.0	30.90	9,641
Farley Fruit Co.	56.7	30.87	10,161
Corda Bros.	28.0	30.80	9,730
Michael K. Reed	46.7	30.80	9,211
Joe Gonzalez	8.7	30.67	9,304
Manuel Silva	183.0	30.63	9,408
E. M. Ullrich	95.0	30.62	7,771
Luis Scattini	19.7	30.60	10,981
Lee F. & John M. Silveira	10.0	30.60	7,176
Wilbert Rosa	13.0	30.59	8,320
Bob Corda Sr.	17.5	30.55	9,611
Ralph Panella	75.0	30.55	8,120
Tognetti Bros.	43.5	30.54	10,407
Anthony Vosti	28.5	30.51	10,026
Franscioni, Griva & Son	46.9	30.51	9,907
Franscioni, Griva & Son	64.8	30.46	10,000
P. R. Dixon	42.0	30.43	6,804
S. J. Gallagher	50.0	30.40	10,205
Peter Fanucchi	4.0	30.40	9,579
Luis Scattini	58.2	30.40	8,928
Tadlock Bros.	35.0	30.34	9,405
Botelho Bros.	8.4	30.23	8,731
Lindeleaf Bros.	25.0	30.21	7,331
L. Eveland	34.0	30.20	8,486
Ira E. Hudson & Son	148.8	30.16	10,108
Nishikawa Bros.	35.0	30.12	9,325
Lloyd Foster	21.0	30.07	8,245
James N. Fulmor	230.0	30.06	9,006
Backer & Backer	35.0	30.05	9,291
Peter Lesnini	52.5	29.96	9,370
T. G. Bacciarini	59.8	29.93	10,025
Donald Fong	35.0	29.92	7,516
Dennis Leary	174.0	29.86	7,823
Frassetti Bros.	33.0	29.84	10,703
Nick Albanese	2.5	29.67	9,645
Tsuji & Inouye	82.0	29.67	9,109
G. V. Mahan	29.0	29.62	9,775
Valley Farms	28.0	29.57	9,200
E. L. & C. J. Forden	29.8	29.54	8,327
Joe Jacinto	7.0	29.49	9,682
Charles Yerxa	117.0	29.49	8,558
J. E. Blair	38.0	29.44	7,675
Clark & Togni	20.3	29.42	9,279
M. Romani	142.0	29.33	9,174
P. M. Resetar Co.	23.4	29.27	8,964
Hernandez & Anaya	41.0	29.14	8,625
Ben Kummerfeld	44.0	29.10	8,446
Farley Fruit Co.	30.2	29.07	9,833
Leola Brownell	48.8	28.94	7,369
Malcolm & Anchita	38.0	28.83	10,534
California Packing Corp.	76.0	28.81	7,162
Joe P. Gambetta	38.6	28.79	9,352
Wilbert Rosa	38.0	28.79	7,969
Geo. Fiscalini	37.1	28.78	9,042
Geo. Mills	53.0	28.78	6,895
Ferry Morse Seed Co.	102.7	28.76	8,348
Charles Azevedo	15.0	28.76	7,777
Antonio Garcia Da Roza	13.0	28.75	10,593
California Packing Corp.	70.0	28.74	8,283
Botelho Bros.	60.0	28.74	7,988
E. R. Reel	75.0	28.72	7,852
R. Marci	19.5	28.69	8,665
Wilson M. Lovvorn	60.0	28.59	7,193
T. R. Nishimoto	9.0	28.56	10,260
S. & D. Biancucci	150.0	28.56	8,734
Joe Garsino	35.0	28.54	9,161
Darsie & Gamble	87.0	28.49	8,228
Tony Ferreira	70.0	28.47	7,863
A. C. Madolora	60.3	28.44	9,144
Schween Bros.	52.4	28.40	8,562
Orth Bros.	38.0	28.40	8,202
Paul Odermatt	27.0	28.38	7,208
John R. Breen	20.0	28.37	9,277
Martella Bros.	46.3	28.35	8,500
Hitchcock Bros.	43.6	28.22	8,671
F. & W. Giottonini	26.2	28.20	8,589
Borzini Bros.	55.2	28.17	8,743
O. L. Petersen	9.1	28.14	9,188
Pacific Ranch Co.	71.6	28.13	9,019
Paul M. Marsh Jr.	44.2	28.11	8,659
Richard Moore	154.0	28.11	8,146
Art Manzoni	26.5	28.04	9,575
Allen Moore	113.0	28.04	8,350
Dante Arbrun	17.5	28.03	8,958
J. A. Petit	60.3	28.01	9,100
A. Radavero	19.0	28.01	8,925
C. F. Storn & B. C. Farrell	177.4	28.00	7,906
Pastorino Bros.	147.0	27.99	7,647
Paul Reiff	77.0	27.97	7,585
Roy Wynne	70.0	27.96	8,640
Elmer & Frank Gomes	47.5	27.96	6,991
Jensen Bros.	75.7	27.92	8,399
Charles Yerxa	95.0	27.91	8,211

★ WE PROUDLY PUBLISH THE NAMES OF SPRECKELS GROWERS WHOSE CROPS YIELDED 25 TONS OR MORE PER ACRE. THE LIST INCLUDES MORE GROWERS, MORE ACRES AND A HIGHER PERCENTAGE OF TOTAL SPRECKELS ACREAGE (20.6%) THAN EVER BEFORE—CLEAR EVIDENCE OF COMMENDABLE FARMING.

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Bender Bros.	16.0	27.89	6,844
Frank E. Tavares & Sons	15.0	27.87	10,432
Roscoe H. Pederson	45.0	27.85	7,531
Ralph Panella	35.0	27.85	7,497
Simoni Bros.	74.0	27.84	7,817
Cecil Allen	80.0	27.83	5,773
W. M. Christensen	27.0	27.79	8,677
A. Hile	77.0	27.79	7,987
L. & A. Salmina	21.5	27.78	9,092
J. P. Braycovich	20.0	27.77	8,903
Stephens & Jager	92.0	27.76	8,444
John Plotz	37.0	27.74	8,261
Lind Bros.	26.0	27.71	6,207
J. P. Adams & Son	21.0	27.63	9,249
E. I. O'Connell	28.5	27.55	7,380
Arnold Bassetti	65.0	27.54	8,933
Watsonville Exchange Inc.	47.7	27.52	8,791
A. Frew	35.8	27.51	9,430
Merrill Packing Co.	54.6	27.51	8,052
Kern Co. Experimental Farm	3.0	27.49	7,235
Tom Storm	22.0	27.43	9,380
Frank & Elmer Gomes	10.0	27.41	8,422
Tom Harney & Son	144.4	27.35	9,003
Chester M. Locke	12.0	27.33	6,920
Garnet W. Herbert	97.8	27.31	9,276
Geo. M. Struve	149.0	27.31	7,450
Lawrence Brickey	90.4	27.28	8,414
Gorman & Hulbert	39.0	27.27	8,154
Sequeira Bros.	32.0	27.23	7,791
R. E. Carden	67.0	27.23	6,867
A. Machado	42.0	27.21	8,000
Turri Bros.	87.3	27.19	8,516
River Maid Farms	35.0	27.18	8,170
F. Warner	34.0	27.16	8,436
Trevis Berry	40.0	27.12	7,684
Darsie & Beck	168.0	27.10	7,187
Reiff & Burger Bros.	80.0	27.06	7,620
Chester M. Locke	63.0	27.05	7,752
Louis N. Pelucca	23.0	26.99	8,054
J. E. Culver	89.6	26.98	8,737
Joseph D. Valenti	60.0	26.91	7,874
Fred Banducci	144.0	26.88	8,198
M. P. Domingos	15.3	26.86	9,135
McDonald & Whealey	98.0	26.86	8,767
A. D. Heckert	153.0	26.83	8,677
R. Sargenti & Son	15.7	26.80	9,367
Alfred Riva	21.5	26.78	8,681
Al Massera	32.0	26.77	9,105
Chas. Osborn & Son	55.0	26.73	8,088
Joe Huber	90.0	26.70	8,071
R. E. Myers Co.	36.0	26.68	7,710
Tom & Tony Sanchez	40.0	26.66	7,695
United Farms Co.	18.4	26.65	9,391
John Tavernetti	49.0	26.62	9,052
E. M. Olson	77.0	26.61	7,403
Henry Teraji	15.0	26.60	8,565
Boone Bros.	30.0	26.56	9,308
California Packing Corp.	150.0	26.53	7,025
Anthony Silva	100.0	26.51	9,246
John Rasmussen	18.4	26.49	6,170
Lind Bros.	36.0	26.48	7,705
Malcolm Farms	148.0	26.43	9.039
Phillips Wyman	32.5	26.43	8,070
Fred Banducci	156.0	26.38	7,967
Bassi Bros.	29.9	26.37	8,355
Joe Garsino	14.0	26.37	7,673
K. Kamimoto	25.0	26.36	8,363
Taix Company	68.5	26.34	6,974
L. Verzasconi	21.1	26.33	8,421
Norman S. Frank	50.0	26.31	7,961
Paul Reiff	70.0	26.31	7,177
Nobuo Sakamoto	72.0	26.28	7,695
Frank V. Frates	152.0	26.24	7,651
Mrs. B. J. Marks	224.5	26.23	8,697
Tom & Jack Obata	26.0	26.23	7,620
Orth Bros.	44.0	26.20	7,666
Joe Bastiao	23.0	26.13	8,529
Harold & Elena Christensen	84.8	26.13	7,364
J. B. Simmons	25.0	26.12	7,434
Manuel Dias	4.6	26.10	8,238
Morris Bros.	153.0	26.09	7,514
E. N. & W. F. Winters	33.0	26.06	6,468
Thos. H. Tarp Sr.	38.3	26.05	7,392
Ice Kist Packing Co.	194.3	26.05	7,152
Massa Bros.	14.8	26.03	9,028
Wilder Bros.	56.0	26.02	7,327
Carl H. Becker	65.0	26.01	7,028
H. & R. Kodama	70.0	25.98	8,064
Henry B. Bondesen	36.5	25.96	9,218
Hitchcock Bros.	38.4	25.96	7.972
Ferreira Bros.	71.0	25.96	6,573
M. G. DaRosa	66.3	25.93	8,791
John Vanetti	38.0	25.90	7,718
Gibson Bros.	18.0	25.89	9,825
Corda Bros.	17.0	25.89	8,855
Elmer Righetti	29.0	25.88	8,698
Schween Bros.	29.8	25.86	8,338
Panziera Bros.	36.5	25.86	7,927
Joseph Longeval	40.0	25.86	6,692
Clark & Romans	81.0	25.81	7,718
W. H. Meek	128.0	25.80	7,926
Vincent Scattini	44.7	25.76	9,125
Bennie S. Black	40.7	25.76	8,440
Paul B. Tavernetti	18.7	25.75	8,164
John Vanetti	40.0	25.72	8,112
Bruce Church Inc.	15.5	25.70	8,037
Frick Bros.	144.0	25.69	7,557
Steve Sanchez	5.0	25.68	8,760
A. Frew	70.3	25.65	8,763
Albert Rossi	82.6	25.64	8,275
Fritz Erdman	114.0	25.64	6,636
W. L. Stacey	51.7	25.61	8,207
W. R. Stephenson & Son	21.8	25.61	7,334
Raymond Martin	86.5	25.60	8,189
R. E. Myers Company	35.0	25.59	8,489
Allen Moore	105.0	25.59	7,764
Fred Storz	25.0	25.56	8,343
Jeanne & Gus Lueddeke	34.0	25.56	7,949
R. B. Little	121.6	25.55	8,255
John Oreggia & Co.	60.0	25.46	8,604
R. F. Malcolm Jr.	77.0	25.45	7,772
Dwight Pryor	100.2	25.44	7,922
A. R. Sanders	55.0	25.43	7,853
H. Damsen	18.0	25.42	7,539
Ritz Distributing Co.	35.0	25.41	8,339
Frank V. Frates	38.0	25.35	7,001
Harlan & Dumars	120.0	25.35	6,358
Julio B. Nunes	40.0	25.32	8,347
L. L. Godfrey	142.0	25.32	7,409
George Barry	89.0	25.31	7,476
L. & W. Land Company	33.6	25.29	7,151
Riverdell Farms	70.0	25.28	5,738
Armanino & Marsiano	68.0	25.26	7,351
Harry R. Semas	15.0	25.24	8,406
Norman S. Frank	38.0	25.23	6,015
Mariano Sanschez	13.8	25.22	8,782
Antonio F. Silveira	26.3	25.22	8,518
Joe M. Obata	23.0	25.22	7,513
Luis Scattini	9.0	25.17	8,501
L. L. Leonard	150.0	25.17	6,997
Vanoli & Bravo	31.3	25.14	8,893
Jacob Bros.	29.7	25.08	8,624
E. H. Kunze & Son	160.0	25.08	7,910
William Arcand	60.0	25.04	7,702
Frank Cotta	21.0	25.03	9,200
Coit Ranch Inc.	76.0	25.02	7,531
H. C. Russell	82.0	25.02	6,425

CALIFORNIA COULD EASILY CONSUME ITS ENTIRE BEET SUGAR OUTPUT

EVERY grower of sugar beets in California has a stake in California's sugar business. When the sugar from your beets is sold in home markets, your returns for beets are greater than when the sugar has to be shipped to mid-western markets.

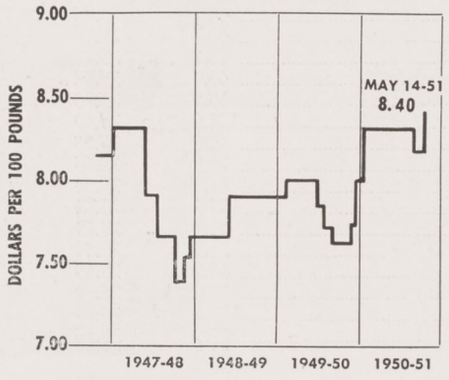
In the March-April, 1951 issue of the SUGAR BEET BULLETIN you were apprised of the fact that deliveries of beet sugar in California have been increasing steadily in recent years.

In the chart on the right, full length of the bars indicates the total production of beet sugar in California during the sales year beginning August 1st and ending the following July 31st. Even in high-production years this is far below the eleven to twelve million bags of sugar annually consumed within the State. Within the bars are shown the deliveries of beet sugar in California, month by month during the same period.

The chart below indicates the quoted wholesale price of beet sugar, f.o.b. San Francisco, showing how it varies from time to time, and how present prices compare with those of former years.

QUOTED PRICE OF BEET GRANULATED SUGAR

In 100 Lb. Paper Bags, F.O.B. San Francisco



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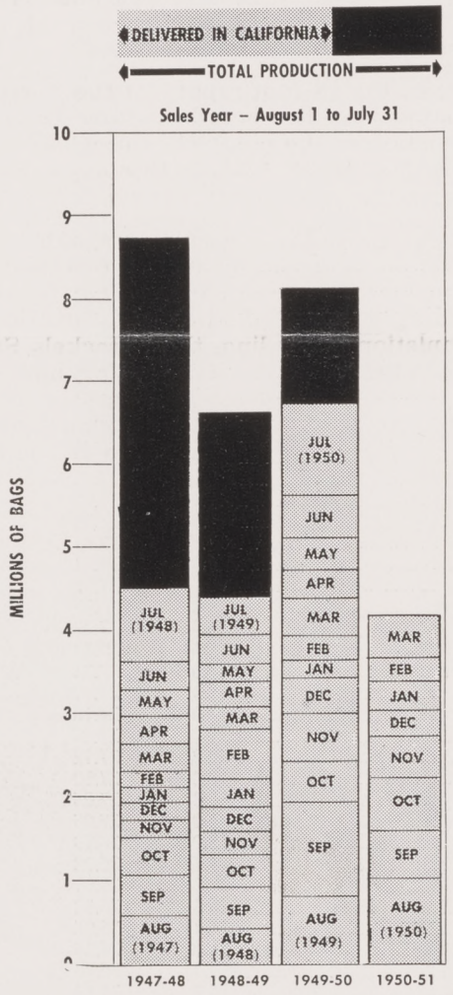
PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



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RECENT DEVELOPMENTS

(Continued from page 19)

to successful, mechanical thinning is the multiple germ nature of the sugar beet seedball. If a seedball were available which would produce a single, strong seedling instead of a clump of seedlings, the task of mechanical thinning could be more easily accomplished. This problem has been partially overcome by decorticating or shearing, but a more satisfactory solution would be the development of a truly single-germed seed. For more than 50 years, the sugar beet breeder has been searching for just such seed. During the second World War, reports from Russia indicated that plant breeders in that country had been successful in their quest. Little more was learned about this discovery until 1947, at which time Dr. and Mrs. V. F. Savitsky, two non-communist sugar beet breeders from Russia, entered this country as refugees, and were employed in the cooperative research program by the Curly Top Resistance Breeding Committee. Although they were unable to bring any single-germed seed with them, they did bring the "know-how" of finding it. The next year, following a painstaking search in the seed fields of Oregon, Dr. Savitsky found a few plants which produced nothing but single-germed seed. These plants were not of a commercial type so it has been necessary to slowly transfer the character to adapted varieties. This work is now in progress in various parts of the United States. In California, we have more than an acre of hybrids between curly top-resistant varieties and the single-germ beet growing at the present time. Breeding stocks which are tolerant to curly top, non-bolting, and possess single-germ seed will be selected and

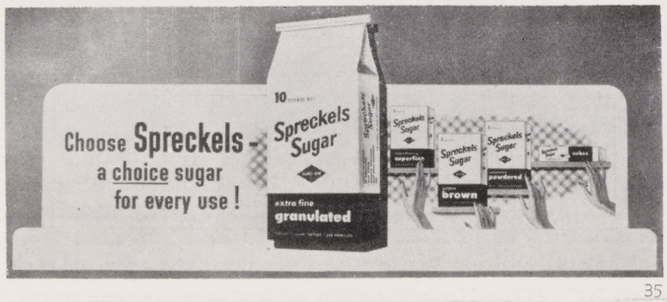
OUTDOOR ADVERTISING WILL STIMULATE SPRECKELS SUGAR SALES

COLORFUL, new painted bulletins are now bringing Spreckels Sugar to the attention of sugar buyers in key markets on the West Coast.

In addition to the 18-foot replica of the Spreckels Fine Granulated bag, the boards picture the other sugars that make up the complete Spreckels line—Confectioners Powdered, Instant Dissolving Superfine, Cubes and the new Golden Brown.

Along with a dramatic, full-color presentation of the entire line, each board urges consumers to "Choose Spreckels Sugar—a choice sugar for every use!" Coinciding with introduction of Golden Brown and the completion of its line, the Spreckels Sugar Company has stepped up its advertising and merchandising program, including an expanded advertising schedule in newspapers and regional magazines, more point-of-sale material, and the painted bulletins.

In the photo at the right, Charlton F. Johnson, Assistant Sales Manager, Spreckels Sugar Company, (center) admires the giant size cut-out that is the outstanding feature of his company's new painted bulletins. Standing on the ladder is Woody Ginn, Sales Manager of Pacific Outdoor Advertising Company, and on Mr. Johnson's right is Tony Whan, President of Pacific Indoor Advertising Company.



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Pacific Outdoor Advertising Co. Photos 36

used in the development of single-germ varieties adapted to California. According to present plans, it is hoped to have a small quantity of curly top-resistant, single-germ seed of a commercial type available for test plots in 1953.

Hybrid Varieties

The condition in sugar beets known as male sterility discovered by Dr. F. V. Owen of the U.S.D.A. Field Laboratory at Salt Lake City is rapidly becoming an important tool for the sugar beet breeder. A plant that is male sterile is unable to produce seed unless it receives pollen from some other plant. This means that all the seed produced on a male sterile plant is hybrid. Beets grown from hybrid seed frequently yield more sugar per acre than those grown from seed produced in the ordinary manner. By planting alternate strips of male sterile (female) beets and pollen fertile (male) beets in a seed field, the seedsman is able to produce seed in the male sterile strips, which is hybrid and of the desired parentage. Results with the best hybrids produced by this method have shown increases in sugar yield of from 10 to 15 per cent. Greater improvement in production can be expected from continued intensive work with this method of plant breeding.

The problem of developing seed stocks which "breed true" for male sterility, together with the problem of handling these stocks for seed production on a commercial scale, has delayed the release of hybrid varieties to the grower. As soon as these problems have been successfully solved, sufficient quantities of seed will be produced for widespread trials in growers' fields.

CHEMICALS WON'T DO THE JOB ALONE

By W. A. HARVEY,

Extension Weed Control Specialist
University of California at Davis

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THE AUTHOR at work in a sugar beet field. This Jeep spray rig is part of the Extension Division's experimental weed control equipment.

GROWING sugar beets successfully requires the combination of many ideas and many farming practices. The control of weeds in sugar beet fields is a typical example of this. There is no magic wand which will rid the fields of weeds. It takes work and planning and a combination of practices to keep a field of beets clean. Chemicals have a place in the overall plan and so do mechanical methods. Seedbed preparation, planting, and irrigation all have an effect on the weed population and the subsequent job of weed control.

This year, with the prospect of short labor supply, it is especially important to plan the weed control work to best utilize the labor that will be available. This doesn't necessarily mean we will have to be content with a poorer job of weed control. It does mean we will have to look ahead a bit and see what we can do today that will cut down on the labor required tomorrow.

We all wish for a selective chemical that will kill all the weeds but not hurt the sugar beets. We are still far short of that goal, and perhaps in looking for such a miracle we have overlooked some of the things we can do with the chemicals and the equipment we have today. Chemicals and mechanical methods are both part of the program. We must fit them together to do the most effective job of growing sugar beets.

All of our chemical weed killers have limitations. All of them are dependent on certain definite conditions or factors in order to be effective. And proper timing in the application of chemicals can be the deciding factor between success and failure.

Pre-emergence—Many of you have tried pre-emergence spraying to cut down on early hand-weeding costs. The variety of results reported from such spraying, even when the same chemicals were used, indicated again the dependence of the chemical on proper management practices. Excellent results with the spray were obtained only when the seed bed was well prepared, when soil moisture was such that the weed seeds germinated, when the right chemical was used and when the operation was planned far enough in advance to have everything ready at the proper time. Under our generally uncertain weather conditions at planting time, pre-emergence spraying, as we know it now, needs a lot of help from management to do the job it is capable of.

Water grass—One of the most difficult jobs in many fields of sugar beets is controlling water grass. Chemical control is desirable but results have been highly variable. This doesn't mean that chemicals are no good and that they shouldn't be used. Sodium TCA would appear to be a natural for the job since it is a good grass killer and has some selectivity. Why hasn't it killed water grass more generally? I think the main reason is that it wasn't at the right place at the right time. In order to get by with low rates that won't damage sugar beets it is necessary to get the sodium TCA on while the grasses are very small. And since the chemical acts mainly through the soil it must be in the soil in solution where the young grass roots can absorb it. Applications on top of dry soil just haven't a chance of doing much good. Where the sugar beets are sprinkler irrigated it is possible to move the chemical into the soil. The tendency here, however, is to wash it too deep so that water grass germinates above the chemical. Sodium TCA is quite water soluble and easy to leach in the soil.

The other chemical approach to the water grass problem has been the use of a general contact spray such as diesel oil selectively placed to avoid the beets. This gets away from dependence on soil moisture but introduces the problem of very careful application. A spray of this type is most effective on young succulent plants and has no residual effect. Thus, it may be necessary to spray after each irrigation if a new crop of water grass emerges. To get accurate placement of the spray and avoid

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CHEMICALS ALONE would not have destroyed the water grass in this beet field. But the right combination of cultural practices would have.

injury to the beets the nozzles must be shielded to protect the beet leaves yet the young grass plants must be exposed. Usually the nozzles are mounted on a shoe which must ride evenly over the ground. There is no one way of doing all this. Grower ingenuity can do much to solve these problems just as it has been a major factor in all of our mechanical advances.

New potential weed-killing chemicals are constantly being produced through the research programs of industry and governmental agencies. Some of these will need testing on the weeds in sugar beet fields. Whether or not they will find a place will depend not only on the chemicals themselves but also on our recognition of the factors concerned in their action. There are many things we can do to aid the chemicals in their action.

Irrigation Practices—As has been mentioned, the use of sprinkler irrigation permits better control of the movement of chemicals that act through the soil.

H. J. Venning, Jr. Photo 39

WHEN BEETS are planted on well-formed beds, water can be confined to the furrows so that water grass will not germinate in the less moist soil on top of the beds.

But with careful furrow irrigation and bed planting it is possible to irrigate after the beets are up so the tops of the beds remain dry. This means that the water grass problem will be confined to the furrows and the edges of the beds where cultivation is possible. Water grass won't germinate in dry soil or from a very great depth. A little care in the irrigation can be the difference between a serious water grass problem in the row or water grass mainly in the furrows.

Cultivation Practices—Too much unnecessary soil stirring serves to bring more weed seeds to the surface. These germinate after the next irrigation and require further stirring of the soil for control. Cultivation for weed control should be shallow and if a bladed implement is used it should be kept sharp. Precision cultivation might well be a companion step to precision planting. Remember that setting the cultivator disks or knives only ***one inch*** closer to the row can reduce remaining weeds as much as 50 per cent.

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MOVE THOSE DISCS closer together! If each disc is moved only one inch closer to the row center, the weeds left for hoeing may be reduced by one-half.

General Weed Control—Frequently we try to keep down the weeds in the cultivated portions of the fields but let them grow along the fence row, in the ditches, and in waste areas around the field. These are the areas where control is relatively easy but they can serve as a source of infestation for the fields where their control is difficult. Attention to these areas can save considerable in hoeing costs in the field itself and are part of the overall weed control program.

Rotation Practices—It is often difficult to control certain weeds in sugar beets. In the overall rotation, however, it may be possible to get in our best licks at a different stage or during a different crop. Planning several years ahead, where possible, is one of the best ways I know of getting clean fields. Some weeds are more of a pest in a particular crop than in others. If we do a good job in the crops where they can be readily controlled it makes the problem easier in the whole rotation. We aren't going to eradicate all of our weeds even with the best of practices. We can cut down on the tax the weeds levy by paying attention to weed control at every stage of the rotation and at each operation on the field during the season.

This whole discussion boils down to a problem in land management. Weeds are only one of the factors in production and they shouldn't be considered separately. Weed control is tied up with the rotation, with seed bed preparation, and with irrigation as well as with cultivation and spraying. Chemicals are a part of the program. They will help us only to the extent that we help them and use them properly. They won't solve all our weed problems but they will save us money if we fit them into an overall program for good farming practices.

VETERAN BEET GROWER IS SPRECKELS' OLDEST TENANT

By HENRY SEVIER
Superintendent of Ranches,
Spreckels Sugar Company.

THIS is a brief history of the oldest tenant of the Spreckels Sugar Company ranches — oldest in years as well as in tenure. It tells of a man who has had the privilege of living the life of his choice, who has been happy to draw his livelihood from the soil, happy to have spent fifty-three years of his life on the same plot of ground in the shadow of the great Spreckels Factory One. It is the story of a farmer, a beet grower, a fine gentleman.

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ROSS PAULSEN

Ross Paulsen's first job in connection with the sugar industry was delivering beets from his father's farm in Green Valley, near Watsonville, to the original Spreckels Factory at Watsonville. This was in 1889, when young Ross was thirteen years of age. At that time beets were hauled in wagons drawn by six or eight horses and were unloaded by hand; the grower received $4.50 per ton for his product.

At the age of fifteen Ross worked in the Factory during campaign. He recalls one incident which nearly ended his connection with the Company. He was working with several other boys who clowned a bit during slack periods by throwing wet sacks at each other. One soggy missile sailed over a machine and struck Mr. Waters, the Superintendent, in the head, sending his derby hat rolling over the wet floor. Mr. Waters stormed around to the boys exclaiming wrathfully;

"I say, I say, you boys are all fired."

Young Ross stepped forward and apologized, "Mr. Waters, I threw that sack, and it wasn't meant for you."

Mr. Waters reply was a tremendous relief, "I say, I say, Paulsen, don't let it ever happen again."

In 1897 Ross heard that the Company was leasing land near the new factory which was being built at Spreckels. He applied for a lease and obtained the last piece of ground available. He then went to Spreckels to inspect his new domain. He found a new three room house being finished and a young surveyor laying out ditches. This engineer proved to be the late Mr. Charles Pioda, who assured him that he was standing on lot number 8, his future home. Ross says that he could even then feel his feet sprouting roots.

Having arrived he was loathe to leave so he went to work building ditches for the princely reward of two dollars per day and board for himself and four horse team. His pay for this work was the sole income for 1897-98 since a barley crop, planted before irrigation was available, failed due to a dry season.

In 1900 Mr. Paulsen planted his first beet crop and averaged 20 tons per acre at $4.50 per ton. One fourth of this went for rent and another fourth for labor. Japanese laborers thinned, hoed, topped and loaded the beets for $1.10 per ton. Under the terms of the lease the whole acreage was planted to beets during 1900, 1901 and 1902. It then became apparent that something was wrong so a rotation was set up, barley being planted one year in four. The ranch was irrigated with waste water from the factory and trouble was experienced by the tenants from an excess of lime and an increasing nematode population. Finally it was necessary to discontinue beet plantings for a while and alfalfa was raised for several years.

In 1926 or 27 lettuce entered into the picture and finally a rotation was established which included sugar beets. At this time share rent was abandoned and a cash rental system put into effect. Some of the tenants gave up their leases rather than pay cash rent but Mr. Paulsen weathered this storm as he had weathered many others and stayed on his lease. There are now no tenants on the Ranch who were there during the first 28 years of his tenure.

In 1911 Ross married Sena Elizabeth Hansen of the Buena Vista district and the couple still live in the little house on Lot 8, to which two rooms have been added. They have more friends than most people have troubles.

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HENRY SEVIER (left) chats with Ross Paulsen. For 54 years Mr. Paulsen has toiled and prospered on his lease across the road from Factory 1.

The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers.
Mention of specific methods, devices or implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.
AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

SPRECKELS SUGAR BEET BULLETIN

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PILING BEETS FROM RAILROAD CARS

This was one of the bold measures taken to accommodate the sugar beet crop of 1950-51

ACREAGE
YIELDS
WEATHER

all broke records and contributed to harvesting problems for grower and processor alike.

See page 28

Vol. XV JULY - AUGUST, 1951 No. 4

PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

THE 1950 SUGAR BEET HARVEST

By

G. D. MANUEL

General Agriculturist, Spreckels Sugar Company

THE last sugar beets from the 1950 crop were harvested in May, bringing to a close the largest and longest campaign in the history of the Spreckels Sugar Company. Over 1,600,000 tons of beets were purchased by the company from California beet growers. The total value of the beets to the growers will be approximately 20 million dollars.

Unusual weather conditions seemed to be the keynote of the entire growing and harvesting period. First, conditions for planting and obtaining stands were ideal, and little or no acreage was lost between contracting and harvest. (Normally a loss of from 8 to 10 per cent of the acreage may be expected). Second, the beet tonnages per acre were the greatest in the history of the company. These two factors added up to produce more beets than had ever before been received by the company.

To facilitate the handling of such a large crop, the three factories of the company had to be kept operating at top capacity. Each of them reached a new record high in tons of beets sliced per day. Plans were also made for piling beets in far greater amounts than ever before. New equipment was designed and installed at our Salinas factory to handle the piling of rail deliveries. This overall program of increased deliveries would have allowed the completion of harvest by the middle of December, had the weather been anything like normal.

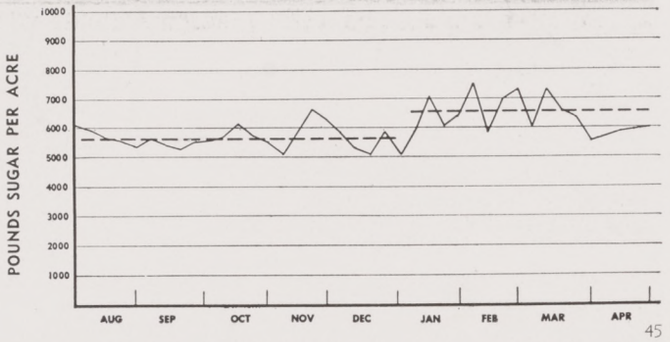
Again unusual conditions struck a blow to harvest. Heavy rains fell during the last of October and again in November, which impeded and finally stopped the harvest completely. About 1,000 acres of beets were flooded during these November storms, of which 685 acres were entirely lost.

When it was realized that harvest was coming to a standstill and probably would continue only sporadically for some time, plans were made to run the Woodland factory whenever any beets were available, and maintain the Manteca plant as a standby.

One of the wettest winters in a number of years prevented the harvesting of any substantial quantity of beets. The Woodland factory ran at only part capacity and was forced to shut down on three separate occasions.

Freakish weather continued; the rains ceased on the first of March and a history-making dry period started. This sudden switch in weather conditions permitted growers to start all their harvests at once and beet supplies rapidly exceeded the capacities of the Woodland and Manteca factories.

The Salinas factory had been closed for annual overhaul, and could not be put into operating condition soon enough to accommodate this unprece-



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THIS CURVE shows how the yield of sugar per acre varied from week to week during the 1950-51 harvest (Sacramento District). Notice how the average yield (straight dotted line) was greater for beets harvested in the spring of 1951. This phenomenon was one reason for the record-breaking yields of 1950-51.

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THE LAST of the beets piled in April were unfit for sugar production. The hot sun literally melted the piles into pools of molasses, as shown in this photograph taken April 17th at Woodland.

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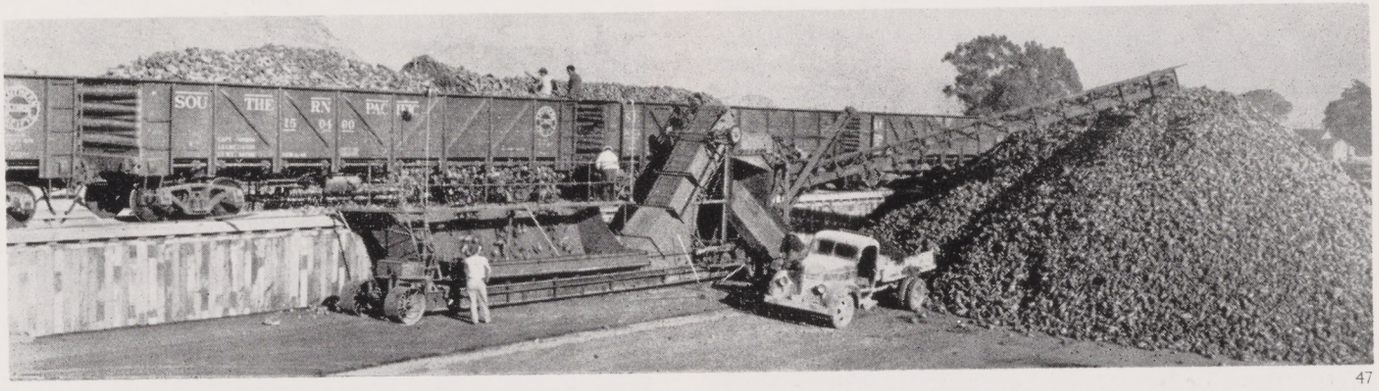
THE HYDRAULIC truck-dumping hoists first used in 1949 helped greatly to speed up beet receiving in 1950. All permanent Spreckels beet dumps are now equipped with hydraulic hoists.

dented post-season inrush of beets. The Spreckels Sugar Company therefore decided to accept beets in excess of factory capacity and pile them, realizing that a good percentage were certain to be lost in warm weather. This program enabled growers to speed up their deliveries and most of them completed harvest by the end of April. The piled beets were exposed to considerable hot weather, and a substantial tonnage was unfit for the production of sugar. In all, approximately 11,000 tons had to be discarded at the two factories—a loss entirely absorbed by the Company.

Because of the great concern over leaving beets in the ground through the winter, careful records were kept over the entire period to determine the variation in sugar content and yield. These records show that most of the beets continued to grow until some time in February. Sugar content did not go down any more after the heavy rains in Novem-

(Continued on Bottom of Page 30)



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FOR THE FIRST TIME, rail-delivered beets were put into piles. This special unloading equipment was designed by the Agricultural Department and placed in operation at the Salinas factory.

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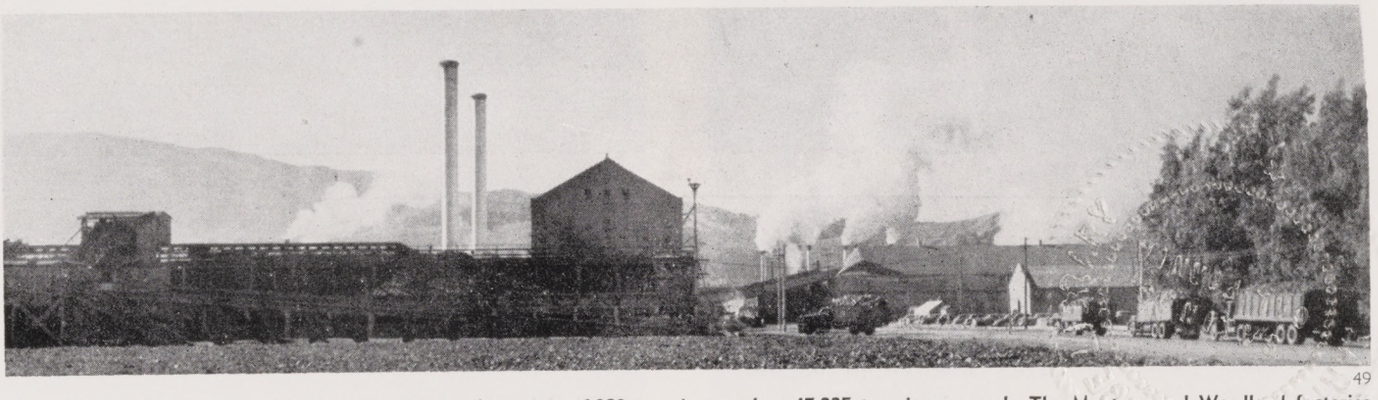
WHEN THE RECORD beet crop of 1950 used up all available railroad cars, special trucks were pressed into service at the rail dumps. In this emergency, truck service was as dependable as rail freight.



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THE SALINAS factory sliced beets at a record breaking rate—6,929 tons in one day; 47,225 tons in one week. The Manteca and Woodland factories also beat their best previous records by wide margins.

COMPANY EXECUTIVES STEP UP TO NEW POSITIONS

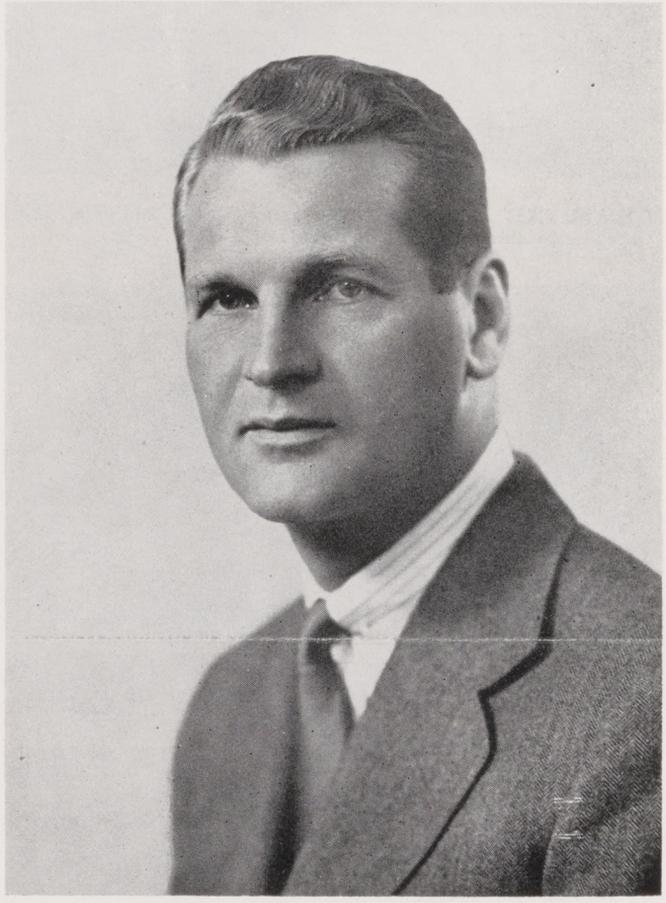
WITH a view to broadening the active executive organization of the Spreckels Sugar Company, the Directors at their meeting on June 19th created the office of Chairman of the Board and elected Carl J. Moroney to that office. At the same meeting, Charles de Bretteville was elected President.

Mr. Moroney has long been associated with Spreckels Sugar Company. Upon graduation from Stanford University in 1910, he joined the engineering staff of the Western Sugar Refinery, San Francisco, and subsequently served as Refinery Superintendent, General Manager, and President of that organization. Mr. Moroney has been President of Spreckels Sugar Company since 1946.

Mr. de Bretteville, a native Californian and a graduate of Stanford University, also attended the Harvard Graduate School of Business Administration. Joining Spreckels Sugar Company in 1935, he was Division Sales Manager of the company in 1942, when he entered the Navy. During World War II, he was on combat duty in the Pacific area with the rank of Lieutenant Commander. Mr. de Bretteville has been a Director of Spreckels Sugar Company since 1947. He is also President of Spreckels Companies, a corporation organized in 1948, and Pampanga Sugar Mills, and is a Director of Bishop Oil Company and Calaveras Cement Company.

The American Sugar Refining Company has owned a half interest in Spreckels Sugar Company since the latter's organization in 1897, and acquired control last year by buying a majority of the stock of Spreckels Companies, which owns the other half. The stock of Pampanga Sugar Mills is owned jointly by Spreckels Companies and Calamba Sugar Estate, Inc.

Carl J. Moroney *Boye* 50



Charles de Bretteville *Boye* 15

1950 HARVEST (Continued from Page 29)

ber. In many fields the figures showed an actual gain in sugar per acre over the October and November harvest. While bolting began to show up on a large scale in April, the sugar content did not change materially and the seed stalks were not large enough to interfere with harvest.

The aggravation and expense of such a long harvest has been felt by both the sugar beet growers and the processor. It is our hope that such a combination of circumstances will never again arise—there is scant probability that it will.

The Spreckels Sugar Company wishes to thank its growers for the cooperation and understanding displayed throughout the unusual harvest that is now behind us and wishes them a very successful crop year in 1951.

AGRICULTURAL DEPARTMENT STAFF "GOES TO SCHOOL"

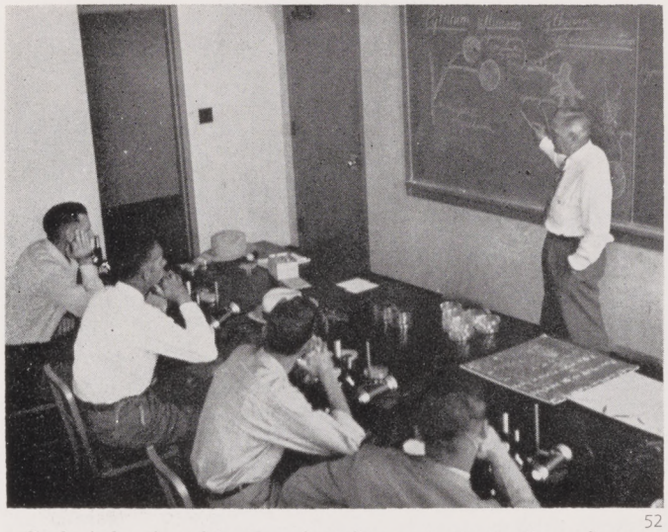
IN order to acquire first-hand information on the latest cultural practices in sugar beets, members of the Spreckels Agricultural Department staff benefitted from a three-day session in field, laboratory and classroom. District managers, agricultural superintendents and field superintendents all became short-term students.

The University of California at Davis graciously provided classroom and laboratory facilities in the Divisions of Plant Pathology and Entomology. Dr. Lysle Leach had prepared a comprehensive "short course" on the subject of sugar beet diseases and their control. The staff learned, via microscopes and able lectures, the latest control methods of all serious ailments of the sugar beet crop. Dr. Harry Lange, Entomologist, then took over the "class," and presented a concentrated discussion of control methods for the principal insect pests of sugar beets.

The second day of the meeting was spent at the Shell Agricultural Laboratory near Modesto. Conducted by the Shell Oil Company, this laboratory and experimental farm is a highly organized experiment station dedicated to agricultural research. (See Spreckels Sugar Beet Bulletin, May-June, 1947—page 18). Dr. Roy Hansberry, its able director, was host to the staff, who were given a glimpse of the basic research on biology, entomology, and all plant sciences involving the use of agricultural chemicals.

The subject of sugar beet seed breeding was thoroughly investigated on the third day, and Dr. John McFarlane of the United States Department of Agriculture conducted the staff on an instructive tour of seed breeding plots which he has planted.

The more specialized breeding work headed by Dr. Russell T. Johnson of the Spreckels Agricultural Department was viewed on the Spreckels Plant Breeding Farm. Advances made to date indicate the general work of the United States Department of Agriculture, coupled with the specialized work of Dr. Johnson, will result in sugar beet varieties capable of greatly widening the sugar beet growing areas, and lengthening the growing season by the eventual production of single-germ sugar beet seed.



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Dr. Lysle Leach explains sugar beet diseases to an attentive audience.

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Dr. John McFarlane, USDA, demonstrates downy mildew plots.

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The Agricultural Staff gather at the Shell Agricultural Laboratory.

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Dr. Russell T. Johnson displays some of his single-germ sugar beet plants.

WOODLAND GROWER BUILDS GIANT SUGAR BEET LOADER

DAN Best is a practical farmer with a genius for building equipment that works. Included in his extensive farming operation north of Woodland were 195 acres of sugar beets for harvest in 1950. Dan guessed correctly that rain might interrupt his harvest, and he prepared for it.

Orthodox beet harvesters won't work in the mud. Neither will a hand crew. But a combination of a very unorthodox harvester and a ten man loading crew kept rolling the beets into the Woodland factory between the showers that broke rainfall records last winter.

While cross-row loaders are standard equipment for lettuce in California and pineapples in Hawaii, they have always had trouble in sugar beet fields because:

1) Trucks could not stay with them at their slow forward speed.
2) Loaders could not pull themselves across cloddy or muddy beet fields.

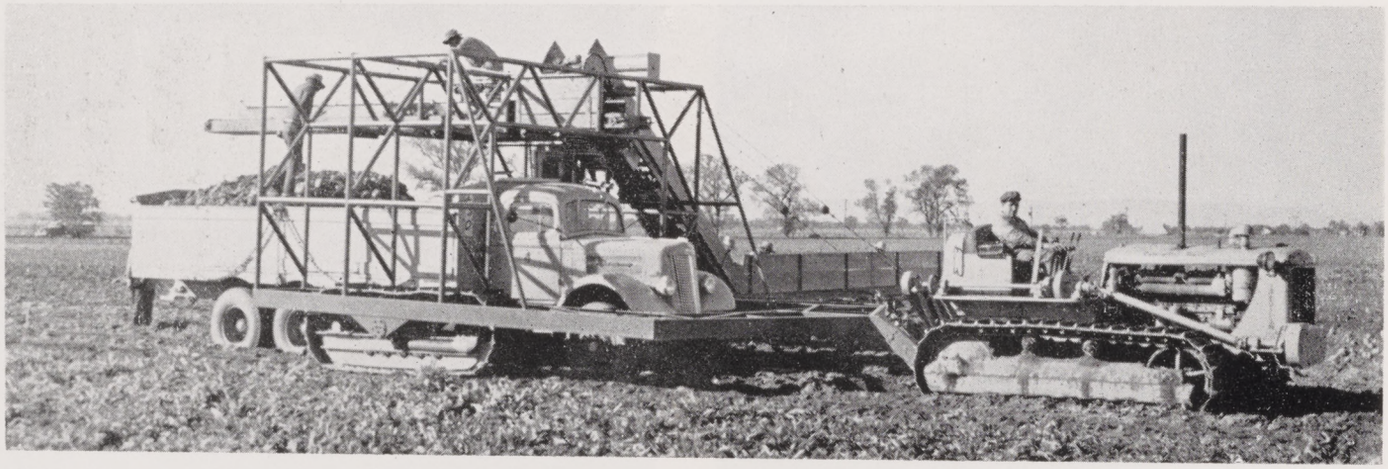
These two obstacles were met and overcome by Dan Best. He boldly designed the loader frame so large as to admit a ten-ton truck into a travelling "loading dock." He built the loader on tracks instead of wheels and powered it with a Caterpillar D6 tractor, specially geared down to operate at 1/5 M.P.H.

A John Deere LUC power unit of 12 H.P. supplies ample power for the cross-conveyor and distributing belt, and makes the loader independent of the tractor power takeoff.

Once hitched to the towing hook in the "loading dock," the truck remains under the loader discharge belt, without need of either driver or engine power. The truck driver mounts the second-story platform where he directs the flow of beets from the discharge belt with a moveable deflector. Thus a neatly distributed load takes full advantage of truck capacity.

The loading crew picks up the plowed beets and tosses them onto a potato-chain conveyor which spans 20 rows.

An average day's output of the loader and ten-man crew is 160 tons. The men in the crew prefer working with the machine because they get a 5 minute rest between trucks, and work at an easy pace because of the slow forward speed of the machine.



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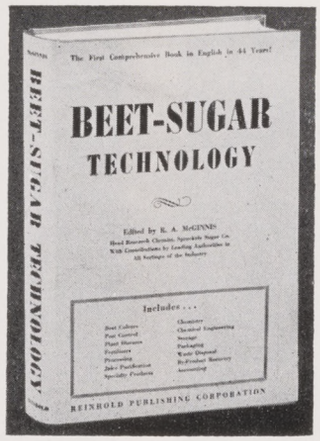
DAN BEST'S big loader in operation. The Caterpillar D6 pulling the loader and truck is slowed down to 1/5 MPH by taking engine power from the front power takeoff through shafts, clutch and chain drive to the rear power takeoff, which is geared to the main transmission.

"BEET SUGAR TECHNOLOGY" IS NOW AVAILABLE

"BEET-SUGAR TECHNOLOGY", the Reinhold Publishing Corporation's new book, edited by R. A. McGinnis, and written by 37 experts from all parts of the industry, was scheduled for production late in May, and is available now at all principle book stores. The compilation, which is the first comprehensive, advanced treatise in English in forty-four years on the growing and processing of beets for sugar, is 580 pages in length, contains 250 illustrations and 50 tables. The book retails for $10.00.



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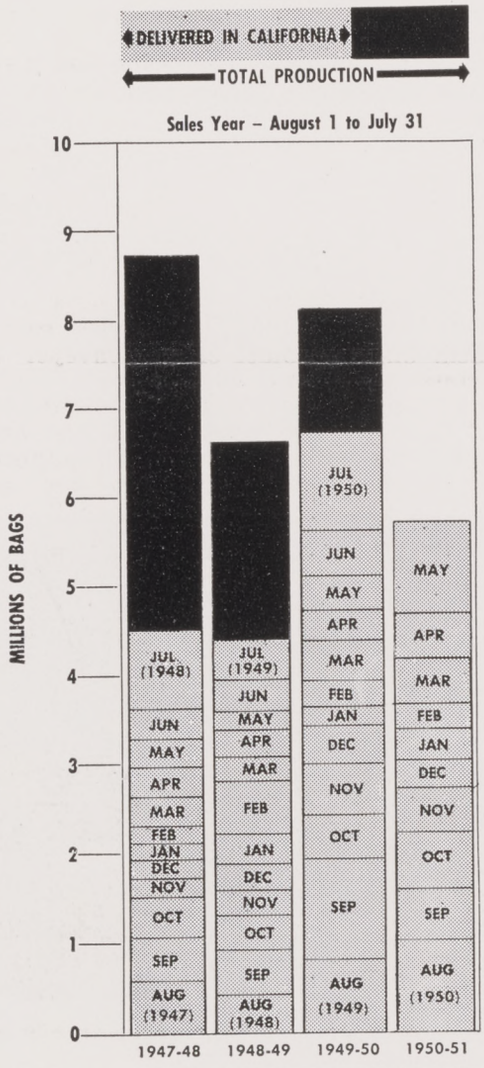
Walter Bernhardt

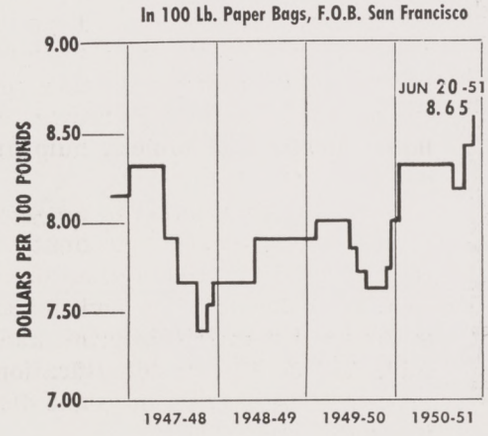
The work is an advanced manual on beet-sugar making, with additional large sections on agriculture, packaging, by-product recovery, waste disposal, and history; and for the first time in any book, tare laboratory operation, specialty products including brown sugar, liquid sugars and tablets, pulp drying, and technical accounting.

Of particular interest to growers is a factual, comprehensive account of current practice in beet agriculture. The section on insect pests and nematodes is the most complete in print, and contains full details for identification and control. The section on plant diseases is equally outstanding.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR



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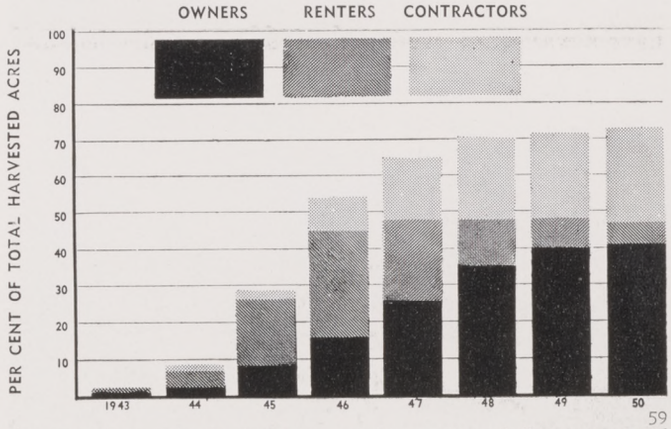
TRENDS IN MECHANICAL HARVEST

By
AUSTIN ARMER
Agricultural Engineer, Spreckels Sugar Company

THE acceptance of sugar beet harvesting machines by California growers has been closely observed since 1943, when mechanical harvest started its spectacular rise to popularity.

The trends which became apparent two years ago continued in 1950. The bar chart below illustrates these trends quantitatively. It must be realized that this chart is based on percentage of harvested acres, and that the record acreage for 1950 reflects a very substantial increase in contract harvested acreage and the number of grower-owned machines.

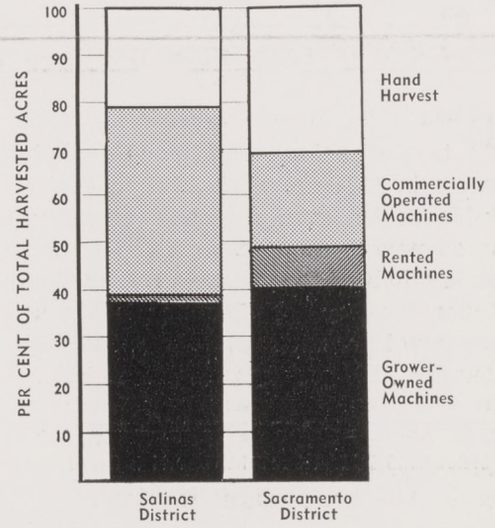


59

EIGHT YEARS of mechanical harvest point to eventual disappearance of harvester rental, with nearly equal acreage harvested by contractors and grower-owners.

Another variable not revealed by this chart is the difference in harvesting customs in different areas. The bar chart below demonstrates the preferences in the Salinas District (25,470 acres), compared to the Sacramento District (54,411 acres), which includes both Sacramento and San Joaquin Valleys.

(Continued on Bottom of Page 34)



60

HARVESTING CUSTOMS vary in different areas. While the Salinas District leans toward contractors, the Sacramento District favors grower-ownership of harvesters.

NEW PRODUCTS INCREASE SPRECKELS SUGAR SALES

SALES of Spreckels Sugar in Western markets are now stimulated by the introduction of two new products. These attractive consumer items make the Spreckels Sugar assortment the most complete in California, and offer Western retailers the maximum incentive to "Sell Spreckels."

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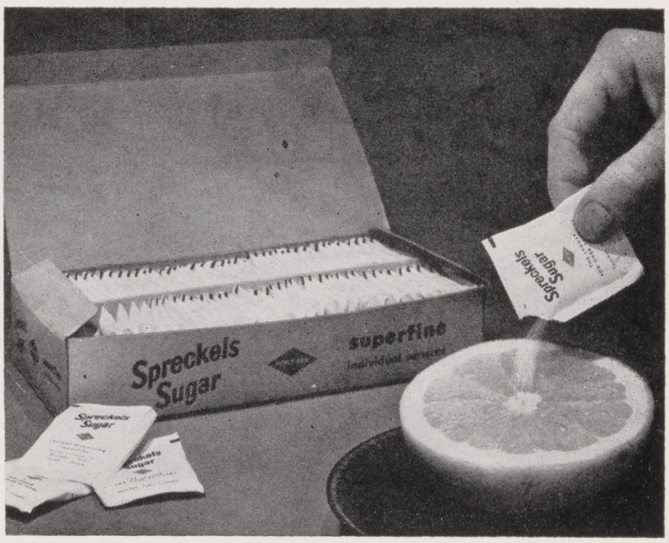
Spreckels Sugar and Cinnamon

Spreckels SUGAR and CINNAMON offers housewives a handy new way to use and serve the tasty components of cinnamon toast. Not only is it perfect for cinnamon toast, but it also adds zest to baked apples, hot cereals, apple sauce, waffles, custards, puddings, and pies. Spreckels SUGAR and CINNAMON is becoming a featured grocery specialty, displayed and sold in sugar departments, with rice and cereals, with cake and waffle mixes and at the check stands.

Another new product—Spreckels Superfine Packets—is being put to good use by an impressive number of hospitals, hotels and restaurants, drive-ins and schools—and orders have been received from two major airlines.

Many buyers of our new Packets are ordering them with their own "crests," or trademarks, on one side, the Spreckels name on the other. The new servings have many obvious advantages from the customers point of view (clean, neat, and handy) and they also add to the fame of Spreckels Sugar . . . help boost the sale of all our consumer products.



Childress-Haberstadt 62

Spreckels Superfine Packets

TRENDS

(Continued from Page 33)

Most of the harvesters acquired by Spreckels growers in 1950 were Marbeet midgets. A few two-row Marbeet harvesters were purchased by growers —some new machines, and some rental machines made available by Spreckels Sugar Company.

A trend of real significance is the swing toward single-row harvesters throughout all beet-producing states. In 1950, growers purchased 179 Marbeet Midget machines. Harvester manufacturers, aware of this trend, have set up their 1951 production schedules to meet this strong demand for single-row harvesters. Production schedules for 1951, by the leading manufacturers, are tabulated below.

Make	No. of Rows	No. of Machines
International	1	1250
John Deere	2	200
Marbeet	1	350
Scott-Urschel	1	300

The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers.
Mention of specific methods, devices or implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.

AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

SPRECKELS SUGAR BEET BULLETIN

63

GOOD TOPPING PAYS

Growers who do a clean and accurate topping job benefit from

LOWER TARES

FASTER DELIVERIES

REDUCED HAULING COSTS

Aids to better topping are discussed on page 36.

Vol. XV SEPTEMBER - OCTOBER, 1951 No. 5

PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

GOOD TOPPING PAYS

By WALTER BUCKINGHAM

Agricultural Superintendent, Spreckels Sugar Company

WITH the advent of the mechanical harvester, problems developed which did not exist with hand topping of beets. Poor topping quality and the breakage of beets became serious. During World War II, this condition was somewhat overlooked because the lack of hand labor created a serious emergency. But after the emergency had been met, the tolerant attitude toward poor topping quality persisted. Poor topping creates a trash problem. Whether it be dead leaves adhering to the beets, or foreign materials such as watergrass, Johnson grass, or other weeds, efficient factory operation is seriously hampered. Figure 1 shows a two-hour accumulation of trash at the Woodland factory which resulted from poorly managed mechanical harvest.

Poor topping has a definitely depressing effect on the grower's operations. Trash and poorly topped beets reduce the slicing capacity of the factory and delay the completion of harvest by the grower. In addition to delays, the grower is penalized by high tares when he delivers poorly topped beets.

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Figure 1. THIS PILE of trash was separated from beets received at the Woodland Factory in a period of only two hours.

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Figure 3. ROTO BEATING twice is accomplished in this case by moving over only one bed each time the two-bed Roto Beater is turned at the end of the field.

Various methods of mechanical topping are familiar to users of mechanical harvesters now on the market. Care must be taken to make sure that the topping devices on these machines are adjusted properly in order to assure the best topping job of which the machine is capable. It is noteworthy that the Blackwelder Manufacturing Company, Rio Vista, California, is now manufacturing a radically improved disc topper for the two-row Marbeet. This is doing excellent topping, as indicated in Figure 2.

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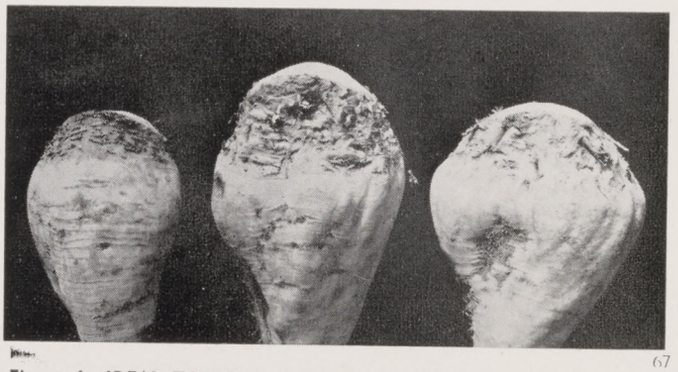
Figure 2. THESE BEETS were topped by the improved disc topper which is now available for two-row Marbeet harvesters.

As a mechanical means of topping, "Roto Beating" has received much attention during the past year. Figure 3 shows an Olsen Roto Beater in operation. It is a general practice that the beets be beaten twice. If beets are to be piled, scalping is a MUST. The crown bud is the most vigorous growing point of the beet and, if not removed, will continue to grow when stored in a pile. Scalping devices are available which, when attached to the Roto Beater, produce the almost perfect topping job shown in Figure 4.

In summary it can be said that the delivery of trashy and poorly topped beets is costly and time consuming to the grower. Machines can and should be adjusted to do an acceptable topping job. The two-row Marbeet harvester will do a far better topping job when equipped with the new disc topper. "Roto Beaten" beets must be passed over twice, and must be scalped if they are to be acceptable for piling.



67

Figure 4. IDEAL TOPPING, as shown on these three beets, can be closely approached by two passes of the Roto Beater when it is equipped with a scalper.

NEW JOHN DEERE HARVESTER NOW IN PRODUCTION

THE John Deere No. 200 Beet Harvester, the result of many years of research and development, is now being built in commercial quantities.

The first machine to come off the production line was rushed to the field for early harvest trials, and did a very fine job. Outstanding feature is the light draft—a John Deere Model A wheel tractor pulls this two-row machine easily in second gear under average soil conditions. Beets are delivered direct to a following truck, and tops are placed in a four-row windrow.

This year's production has been sold "East of the Sierras," so California growers may have to wait a year before the new machine becomes available. But the grower whose row spacing is 20 or 22 inches should investigate this remarkably low-draft harvester.

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THE JOHN DEERE NO. 200 Sugar Beet Harvester in operation. Two men remove clods when soil conditions require this operation. The machine harvests two rows, and the draft is so light that a John Deere A tractor provides ample power.

BULLETIN

On September 1 President Truman signed the SUGAR ACT extension legislation—HOUSE BILL H.R. 4521. The Senate passed the Bill on August 22nd, with only four dissenting votes, after it had passed the House by unanimous vote on August 13th.

In addition to extending the expiration date of the SUGAR ACT of 1948* four years to December 31, 1956, the new legislation will increase the quotas for Puerto Rico, the Virgin Islands and full duty foreign countries and makes minor revisions in other quota provisions of the Act.

Beet growers will be interested in knowing that no changes were made in the conditional-payment and tax sections, and none of the quota revisions should affect the operation of the Act as it pertains to the beet sugar industry.

*Editor's note: An article explaining the provisions of the SUGAR ACT of 1948 appeared in the September-October 1947 issue of the Spreckels Sugar Beet Bulletin.

THE BEET SUGAR INDUSTRY IN IRAN

By DAVID S. STONER
Consulting Engineer
Parsons Johnston Brush International

THE object of my visit to Iran was to locate irrigation water supplies and to recommend their use. Sugar beets were just one of many crops needing irrigation water, so I made no special study of the sugar industry aside from the notes from which the following material was drawn.

Iran is a sugar hungry country in that the national production never meets the consumption. The sugar industry is a Government monopoly, controlled by the Sugar Factories Company—a comparatively recently formed Government Corporation. It runs the factories, contracts for beet production, and is responsible for disease and pest control. It also sets the official price for rationed sugar. There is an extensive black market for sugar which operates quite openly. Ration cards are issued to families, based on the number of members of the family, and call for so many kilos at Government prices. If this is insufficient, people are at liberty to purchase in the open market at, of course, higher prices.

Although the present control agency is rather new, the Government has apparently controlled the factories for some time. There are seven factories which have been operating for some time. In 1949, two new factories were ordered and one of them got into operation last year. Each has a capacity of 700 tons per day. The machinery was made by Skoda in Czechoslovakia.

PRODUCTION AND CONSUMPTION

National sugar consumption is increasing each year. Last year it reached over 165,000 short tons and consumption up to 200,000 short tons is predicted by 1960 or before. Production varies with availability of water and the prevalence of disease and pests. The greatest pests are Caradrina (Army worm) and grasshoppers. The new corporation has ambitious plans for control and will probably take effective action if and when the oil problem is settled and the national revenues are re-established.

Following is a tabulation of beet sugar production figures for 1950:

Acres Harvested	85,165
Tons of beets harvested (1 ton=2000 lbs.)	429,500
Tons of beets sliced	415,850
Tons of sugar produced	60,800
Yield (tons beets per acre)	5.04
Yield (pounds sugar per acre)	1,428
Percent sucrose, average	14.6

The 1950 production of sugar was abnormally high. Production is normally about 38,500 short tons, although in 1947 it was 51,150 short tons. This shows the effect that water and pests have on production, and also the large imports required to meet the demand. For instance, there were 176,230 acres planted in 1949 of which only 54,767 acres were harvested.

(Continued on Page 41)

COVER — Leroy Leonard, Woodland grower, exhibits some well-topped beets.

SUGAR BEET SAMPLING DETERMINES PAYMENTS TO GROWERS

By AUSTIN ARMER, *Agricultural Engineer*
Spreckels Sugar Company

THE value of every truckload of sugar beets delivered to a Spreckels receiving station is based upon the actual net weight and average sugar content. Thus the grower and processor are equally concerned with the accuracy of all steps in the determination of weight and sugar content. It is the purpose of this article to examine critically each step of the weighing and sampling procedure, and to indicate the relative accuracy of these steps.

The basic steps in determing the value of a truckload of beets may be outlined as follows:

Step	Operation	Result
1.	Weigh the truckload of beets as received and record on scalebeam ticket.	Gross Weight
2.	Weigh the empty truck after unloading and record on scalebeam ticket.	Truck Tare Weight
3.	Weigh the dirt screened from the beets and record on scalebeam ticket.	Dirt Weight
4.	Subtract 2. from 1. and record difference on scalebeam ticket.	Net Dirty Beets
5.	Subtract 3. from 4. and record on the scalebeam ticket.	First Net Weight
6.	Take the sample and deliver to Tare Laboratory.	
7.	Weigh the sample as received.	Sample Gross Weight
8.	Tare the Sample.	Crown, Dirt, Rot, etc.
9.	Weigh the sample after taring.	Sample Net Weight
10.	Divide 9. by 7.	% Clean Beets
11.	Analyze the sample.	% Sugar
12.	Multiply 5. by 10.	Pounds Clean Beets (Second Net Weight)
13.	Multiply 12. by 11.	Pounds Sugar Charged to the Factory
14.	Multiply 12. by Price per Ton* and divide by 2000. *From schedule in contract; proportional to net selling price and average percent sugar for contract.	The DOLLAR VALUE of the total deliveries of beets on each contract. Credited to the growers' account.

A series of photographs have been prepared to illustrate these steps. These photographs are reproduced at the bottom of this page and on the following page.

ACCURACY OF WEIGHING OPERATIONS

The accuracy of truck and dirt scales at receiving stations is exceedingly high. State and County laws require an accuracy of plus-or-minus 1/10% on all scales used in commerce, and most truck scales far exceed this degree of precision. The law is well enforced, and the Sealer of Weights and Measures checks the performance of all scales, and certifies their accuracy before permitting their use.

About the only serious error which can occur (and it does a few times every harvest season) is recording the wrong contract number on a scalebeam ticket. It is the grower's responsibility to be sure that each truck driver can identify the contract number of his load. (See Sugar Beet Bulletin, July-August, 1949, page 32).

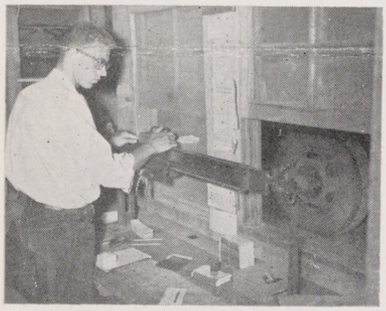
ACCURACY OF SAMPLING OPERATIONS

Many casual observers have expressed doubt as to the accuracy which can be expected of a 20-pound sample from a 5-ton load of beets. Such doubts would indeed be justified if **only one** truckload were sampled. The probability of error in either percent clean beets or percent sugar would be fairly high in this single sample. But as the number of samples (or the number of loads sampled) increases, the probability of error diminishes very rapidly. Furthermore, the errors tend to be compensating—to balance out each other.

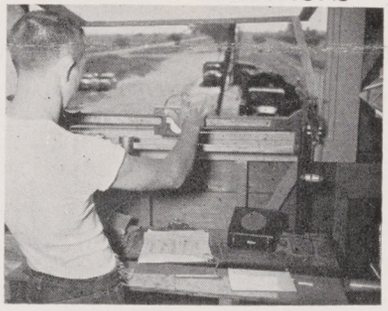
An experiment was performed last winter to demonstrate how a relatively small number of samples will give an accurate indication. A truckload of beets was picked at random from the receiving line, and four samples taken instead of one, as is customary. Then the entire truckload, 9225

(Continued on Page 40)

WEIGHING OPERATIONS



1. GROSS and TARE truck weights are stamped on scalebeam ticket.



2. DIRT WEIGHT is taken and transmitted for recording on scalebeam ticket.

3. AGRICULTURAL OFFICE computes first net weight on scalebeam ticket.

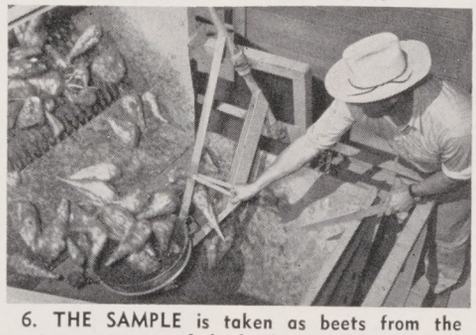
29 200	Beets Gross	CONT. 82-8	DATE 8-5-51	LOT RAN. WV. C-10	Veh. Lic. No. No. 2
10 320	Tare	NAME Sanders			State of California PUBLIC WEIGH MASTER'S CERTIFICATE OF WEIGHT AND MEASURE
18880	Net	Car Num. 150309			This is to Certify, That the following described merchandise was weighed by a Public Weigh Master, and the Seal hereto attached is a recognized authority of accuracy, as prescribed by the California Business and Professions Code, Division 5, Chapter 7.
810	Dirt	Station Conner			SPRECKELS SUGAR COMPANY SAN FRANCISCO, CALIF. Public Weigh Master
18070	Net	Deputy D. Kellner		Load No.	

(8) 09008

4. COMPLETED scalebeam ticket is now a permanent record of first net weight.

SAMPLING OPERATIONS

5. THE SEALED analysis ticket is inserted into a protecting pouch.

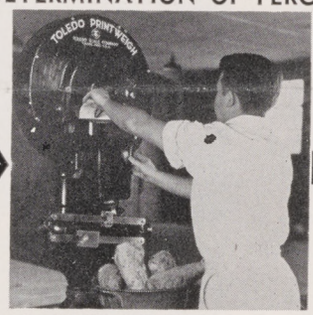


6. THE SAMPLE is taken as beets from the center of the load are delivered.

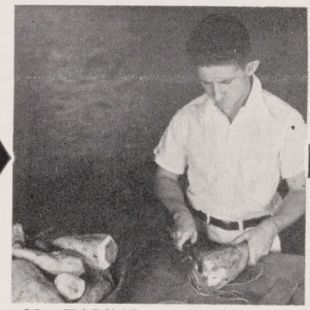
7. THE SEALED analysis ticket and beet sample are deposited in a waterproof bag.

DETERMINATION OF PERCENT CLEAN BEETS

8. AT THE Tare Laboratory the bag is opened and analysis envelope recovered.



9. GROSS WEIGHT of sample is stamped on analysis ticket.

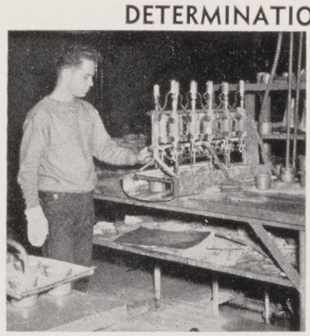


10. TARING removes dirt and any unacceptable crown.

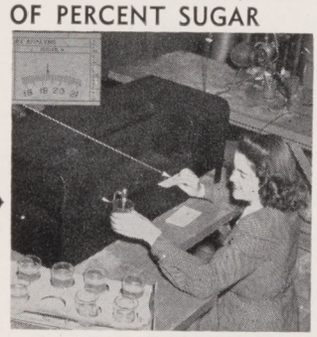
11. NET WEIGHT is recorded, and sample rasped into pulp.

DETERMINATION OF PERCENT SUGAR

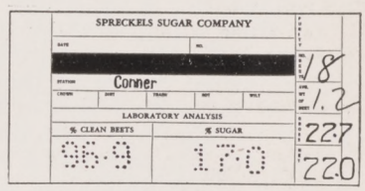
12. WEIGHING PULP on a precision balance.



13. TITRATING pulp sample with lead acetate.



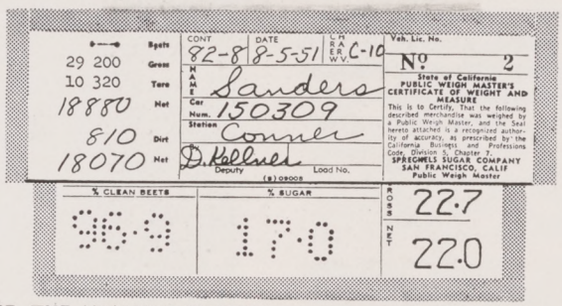
14. POLARISCOPE determines and records percent sugar.



15. SEALED ANALYSIS envelope is perforated with figures representing percent clean beets and percent sugar.

DETERMINATION OF DOLLAR VALUE OF BEETS

16. AGRICULTURAL OFFICE opens analysis envelope.



17. THE ANALYSIS TICKET is stapled to the scalebeam ticket.

18. KEY PUNCH operators record data from step 17.

SPRECKELS SUGAR COMPANY

Sacramento, California

BEET DELIVERY RECORD

STATION	CONTRACT NUMBER	DATE RECEIVED MO.	DAY	YR.	SCALE BEAM TICKET NUMBER	FIRST NET POUNDS	% CLEAN BEETS	CLEAN BEETS POUNDS	% SUGAR	SUGAR POUNDS
82	82- 8	08	5	51	0002	18070	96 9	17510	17 0	2977
82	82- 8	08	5	51	0003	15630	87 7	13708	17 8	2440
82	82- 8	08	5	51	0005	12970	96 9	12542	16 7	2095

19. THE BEET DELIVERY RECORD is the mechanically computed, permanent record of pounds clean beets, percent sugar and pounds of sugar.

U.C. AGRONOMY DIVISION APPOINTS SUGAR BEET SPECIALIST

By FRED N. BRIGGS, *Chairman,*
Division of Agronomy,
University of California at Davis

70

Dr. David Ririe

THE Division of Agronomy is happy to announce the appointment of Dr. David Ririe as Junior Agronomist to work on problems of sugar beet production. This was made possible at this time by financial aid from the sugar beet growers and processors.

Dr. Ririe was reared on an irrigated farm at Ririe, Idaho, where sugar beets were one of their important crops. Therefore, he comes to us with some first-hand knowledge of this crop.

Before going into the service in March, 1943, he spent a year and a half attending Ricks Junior College, Rexburg, Idaho. Dr. Ririe was discharged from the U. S. Army Air Force as Bombardier in December, 1945.

Dr. Ririe was graduated from Brigham Young University with a B.S. in Agronomy. On the basis of his distinguished record at that University, he was appointed Research Fellow at Rutgers University where he earned his Ph.D. with distinction. While there he took a major in soils and a minor in plant physiology, fields in which Rutgers is favorably known throughout the world, and fields which prepared him well to undertake research in sugar beet production.

GUY MANUEL IS NOW VICE PRESIDENT OF SPRECKELS SUGAR COMPANY

On August 13, 1951, Chairman of the Board of Directors, C. J. Moroney, and Charles de Bretteville, President, announced the election of Guy D. Manuel to the office of Vice President. The announcement stated: "Mr. Manuel's election to the vice presidency is both a recognition of his accomplishments and indicative of the importance we attach to our grower relationship and to the position of our agricultural department."

72 Moulin

As General Agriculturist, Mr. Manuel has headed the Spreckels Agricultural Department since 1948. A native of Vacaville and a graduate of the University of California's College of Agriculture at Berkeley, Mr. Manuel is well known to the farmers who grow beets for Spreckels. Following his graduation in 1939 he joined the company's agricultural staff as a trainee and later as assistant field superintendent in the Salinas-Hollister district. In 1942 he was transferred to the Sacramento-San Joaquin district of the company as field superintentent. In 1943 he was made assistant agricultural superintendent and in 1944 agricultural superintendent, with offices in Sacramento. In 1946 he was appointed assistant district manager of the company's Sacramento-San Joaquin district and in 1948 became general agriculturist of the company

SAMPLING

(Continued from Page 38)

pounds of beets, was run through the tare laboratory, so that every pound of beets and dirt was weighed, and 251 sugar determinations were made and averaged. The results are tabulated below:

	Sample Number				Average	Actual Contents of Truck
% Clean	1	2	3	4		
Beets	87.79	89.65	84.86	89.05	87.84	87.58
% Sugar	12.5	14.0	15.1	14.5	14.03	14.15
Pounds Sugar					1000.9	996.1

Thus the average of only four samples indicated the pounds of sugar with an accuracy of 4.8 pounds out of 996.1 pounds, or less than a 1/2% error.

The taking of a sample is one step subject to influence by the operator. However, definite safeguards have been established to eliminate this influence. The field superintendents maintain a constant vigil to make certain that the instructions are followed. The Growers' Association retains an expert who makes periodical checks on each receiving station. And finally the Company sends its own specialists on periodical checking tours.

A number of growers have suggested that an automatic sample catcher would eliminate any possibility of human error in the taking of a sample. In order to test the validity of this suggestion, the author developed a device which after the pushing of a button removes from the discharge belt a sample of about twenty pounds and deposits it in the sample bag, which is then ready to be tied up. This automatic sample catcher was used throughout the 1950 harvest season, and it is interesting to note that the range through which laboratory tare and sugar percentage varied was the same as the corresponding range of variation for samples taken by the customary manual method. It can therefore be concluded that the overall accuracy of the present sampling methods cannot apparently be improved by making them automatic.

The tare laboratory has for its functions the determination of percent clean beets in the sample and the average percent sugar found in these clean beets. "Taring" is a cleaning and trimming operation in which dirt, foliage or other parts of the sample in-

(Continued on Page 42)

A TRIBUTE TO EDWARD A. SCHWING

By H. M. ARMITAGE, *Chief, Bureau of Entomology*
California State Department of Agriculture


73 Fishback
Edward A. Schwing

IT IS with deep personal as well as official regret that the passing of Edward A. Schwing, Entomologist with the Sugar Companies of California, on June 16, 1951, is here recorded. His was a lifetime of service devoted to solving the complex control problem presented by the sugar beet leafhopper, which acts as the sole agent in transmitting the curly top virus to its hosts. This virus at one time threatened the very existence of the sugar beet industry and later caused extremely heavy losses to growers of tomatoes and other susceptible agricultural crops. During his field and laboratory studies he wrestled with this problem which had taxed the thinking of some of the foremost entomologists in the country, and brought to successful application the methods he worked out. He developed not only a national reputation as an entomologist, but a host of friends among those in the entomological profession throughout the nation and particularly in the Western States.

Mr. Schwing was born in 1893 in Alsace-Lorraine, France, coming to this country at an early age. He graduated from the University of Illinois in 1916, with a degree in pomology, soon after moving to California where he first taught in the high school at Santa Barbara and later served as an instructor in pomology at the University of California at Davis. He joined the staff of the Spreckels Sugar Company in 1919 to study the beet leafhopper-curly top virus problem and to see what might be worked out in preventing further losses similar to those experienced during repeated outbreaks prior to that year.

As a result of his studies, which were carried on in close cooperation with State, Federal, and University research workers, he worked out a method of control which has been the major factor in preventing subsequent serious outbreaks, and has effected a tremendous saving to the agricultural industries concerned. In recent years all beet sugar processors in California have supported his valuable work.

His basic finding was that after their fall migration from the central valleys to the warmer and drier foothills, the leafhoppers concentrated in certain areas and under certain conditions. These permitted the effective and economical application of sprays to reduce the numbers that carried the virus back into the agricultural areas in the spring. He determined the materials and methods of application that might be used most effectively in the control measures. He also worked out a pattern of areas and conditions of leafhopper concentration which remains a guide to present day work.

The control operations involved an area of approximately 6,000 square miles of open rangeland, the owners and lessees of which had no direct interest in the problem and who, in fact, felt seriously inconvenienced in their own stock raising operations by the spraying. However, Ed's friendly personality secured their complete and lasting cooperation.

As the acreage of susceptible crops (particularly tomatoes) increased in the control areas, it was felt by the growers that the control work could best be continued by the State Department of Agriculture. Representing the beet sugar interests, in 1943 Ed played a major role in securing the necessary legislative authority and appropriations to continue operations on that basis. He was later loaned to the Department for the major part of two years to train State personnel in the techniques involved. With the permission of the California Sugar Companies he continued to render invaluable advisory assistance in the conduct of these operations up to the time of his death.

Fortunately Ed had recently prepared a summary of his findings covering a period of 30 years' association with the leafhopper problem. The benefits of this record will extend to California agriculture far into the future.

BEETS IN IRAN (Continued from Page 37)

HOW BEETS ARE GROWN

Beet growing in Iran, as with other agriculture, could stand a lot of improvement. The basic need in the country is reform in the land tenure system. A very small percentage of the land is owned by the cultivator. Large areas are owned by the Crown, absentee landlords, and religious sects. The farmer is a share cropper and rents are so high that he only gets a mere sustenance return. Percentages of the gross return are allotted to the land, to seed, to water, to animal or machine power, and to labor. Individual beet plots are usually from 1 to 4 acres. Some lands are cultivated in fairly large units by hired gang labor.

The sugar factories contract for beets at a predetermined price per ton. They furnish seed, mostly free, to the farmer. He plows his little plot with an iron shod wooden plow drawn by oxen, donkeys, camels, or horses. In many instances he spades it by hand. Seed is broadcast in the small fields which are separated by low dikes, and the resultant basins are irrigated by flooding. There is no systematic thinning but some stand reduction results from hand weeding. As a result the beets are small. Beets are usually spaded up and hand topped. The farmer delivers the beets to the roadside where they are hand loaded into factory oxcarts or trucks for conveyance to the factory.

There are large areas in Iran where a salt resistant crop like beets can be successfully grown and at the same time help to cure a bad spot in the national economy. With proper development of surface and underground water supplies, the soils can be improved by growing beets and other crops in proper rotation on these lands.

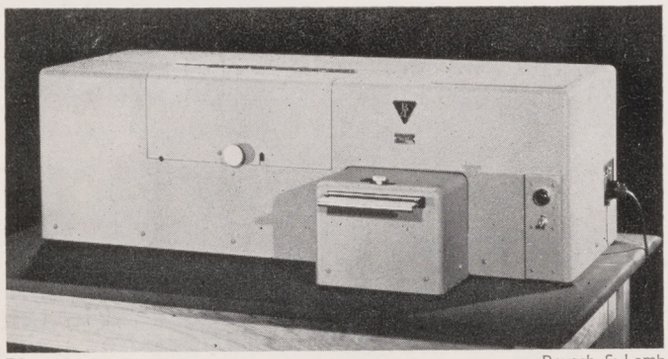
SAMPLING

(Continued from Page 40)

capable of yielding sugar are removed.

The determination of percent sugar is accomplished by rasping the clean beets into a pulp, accurately weighing a portion of this pulp after mixing, adding an accurately measured quantity of lead acetate solution and digesting the mixture in a warm water bath for a fixed time. The clear sugar solution is then filtered and its sugar content determined by a polariscope. All of these operations are under the periodic supervision of an expert employed by the Growers' Association.

The Spreckels Sugar Company, in an effort to increase the accuracy of polariscope indications, has developed an automatic printing polariscope which, after filling the sample tube with sugar solution, stamps on the analysis envelope the sugar percentage with an accuracy about ten times as great as that which can be accomplished by visual observation. The success of this device is attested by the fact that the Bausch & Lomb Optical Company has taken over the manufacture of this instrument and has made it available to the sugar industry at large.



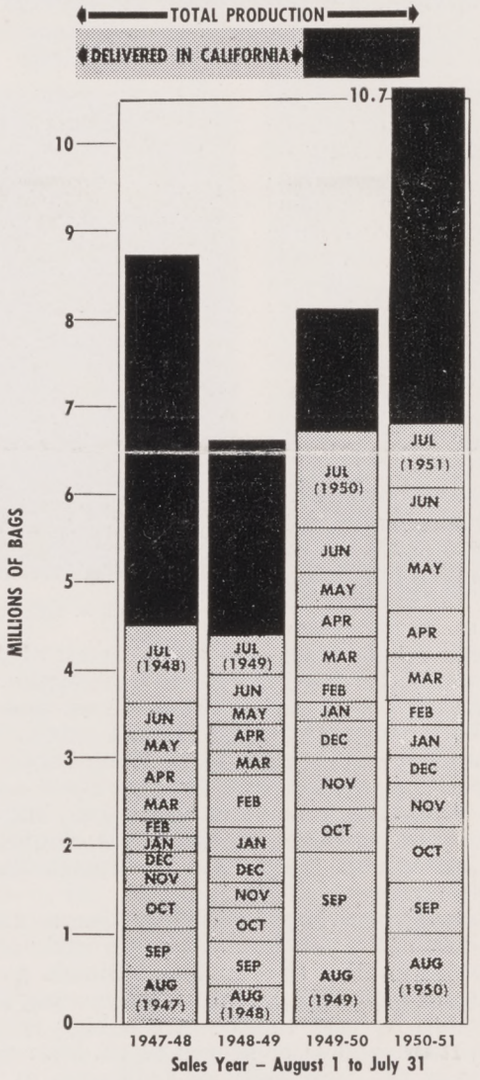
74 Bausch & Lomb

THE AUTOMATIC POLARISCOPE as now manufactured by Bausch & Lomb Optical Company.

It should be stressed that as an additional safeguard against the possibility of deliberate tampering with the indications of percent clean beets and percent sugar, the analysis ticket is sealed in an envelope from the time it is placed in the sample bag to the time that it is opened at the agricultural office, where the facts recorded on it can be used in calculating the dollar value of the sugar beets. Thus the identity of the grower is never known by anyone in the tare laboratory.

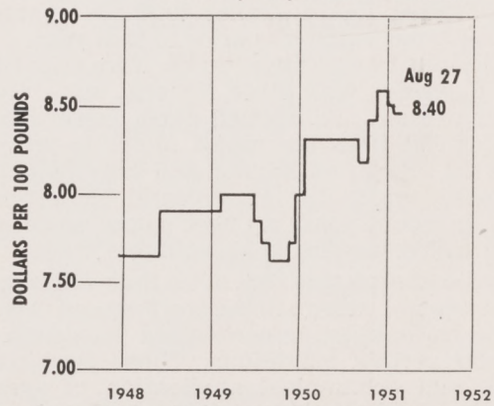
Errors which might occur in the agricultural office, such as mistakes in arithmetic or in copying, have been reduced to the vanishing point by using mechanical calculating equipment wherever possible. Operations involving addition, subtraction, multiplication and division are done by fully automatic calculating machines, and every operation is verified before the answer is recorded on the beet delivery record, which is the final evidence of the dollar value of beets delivered by the grower.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



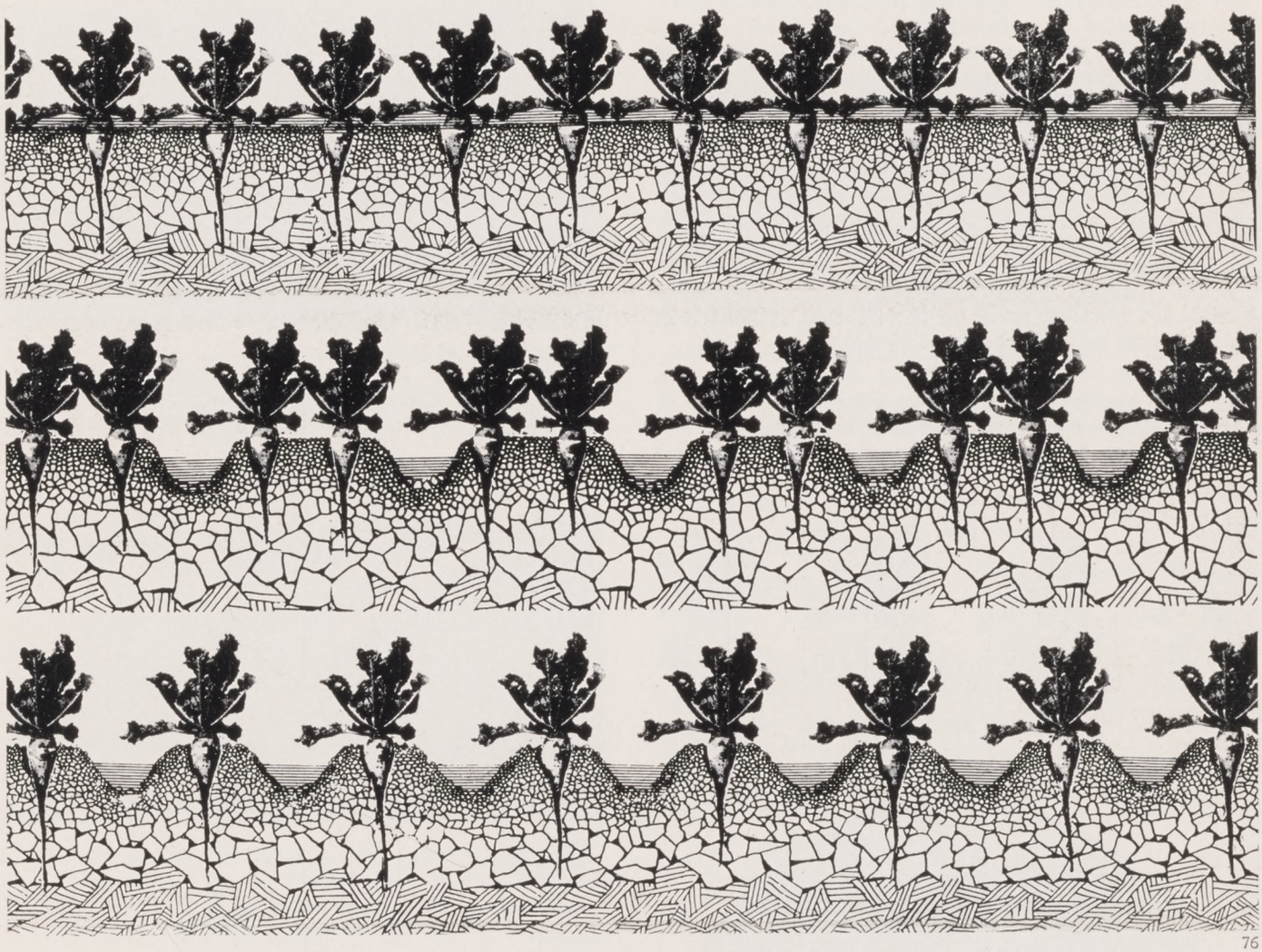
QUOTED PRICE OF BEET GRANULATED SUGAR

In 100 Lb. Paper Bags, F.O.B. San Francisco



The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers.
Mention of specific methods, devices or implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.
AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

SPRECKELS SUGAR BEET BULLETIN



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HOW WILL YOU PLANT YOUR BEETS?

Some of the factors which determine row spacing are:

HARVESTING METHODS
IRRIGATION METHODS
OTHER ROW CROPS

See page 44 — a guide to planting your beets.

Vol. XV NOVEMBER - DECEMBER, 1951 No. 6
PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

HOW SHALL I PLANT MY BEETS?

By AUSTIN ARMER
Agricultural Engineer, Spreckels Sugar Company

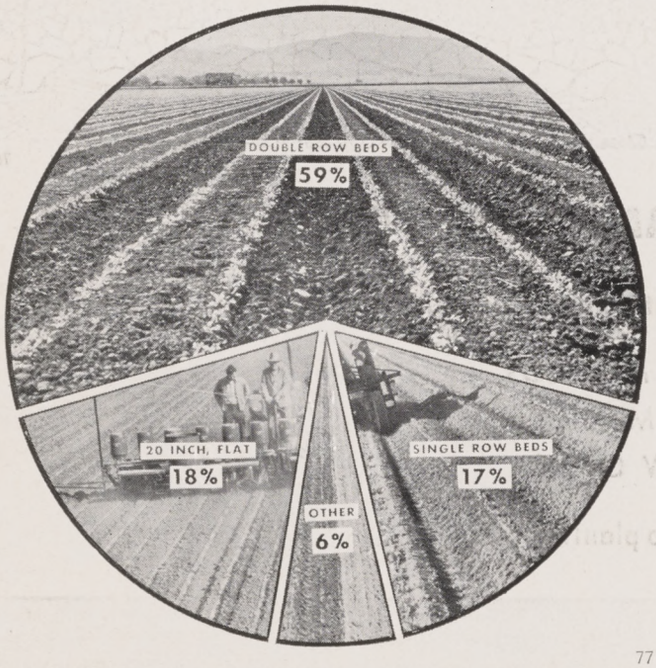
SUGAR BEET row spacings in California are more varied and less standardized than those in any other state in the Union. Since many studies have proved that row spacings averaging about 20 inches give the maximum yields, it appeared worthwhile to investigate the many factors (other than maximum yield), which influence California's row spacings.

The first step was to determine what row spacings and planting systems are in use. All of California's beet sugar processors cooperated to gather the information, and their splendid assistance is hereby acknowledged.

The variety of row spacings used in the three main beet growing areas of the State is indicated in Table I, and by the "pie chart" below.

TABLE I
PER CENT OF CALIFORNIA SUGAR BEET ACRES PLANTED ON VARIOUS ROW SPACINGS

DISTRICTS IN CALIFORNIA	ROW SPACINGS					
	20" to 24"		26" to 34"		12"x28" to 16"x24"	
	FLAT	BEDS	FLAT	BEDS	FLAT	BEDS
Sacramento and North San Joaquin Valleys	18.2%		1.8%	7.7%	3.7%	12.5%
Salinas, Santa Clara, San Benito, Santa Maria Valleys				0.1%		15.4%
South Coast, South San Joaquin and Imperial Valleys		.2%		9.0%	.6%	30.8%
% of State Acreage	18.2%	.2%	1.8%	16.8%	4.3%	58.7%



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THIS CHART shows how the principal planting methods are divided among California's sugar beet acreage.

The great variety of row spacings indicates that the desire for maximum yield does not alone determine row spacing. Neither does the personal whim of the individual grower, as shown by the definite preference for certain spacings in certain areas. The principal determinants of row spacing therefore appear to be well considered factors, which may be grouped as follows:

1. The crops (other than beets) which the grower is equipped to raise.
2. The irrigation system as dictated by soil and water supply conditions.
3. The harvesting method which the beet grower elects to use.

OTHER CROPS

Sugar beets are rarely the only crop grown by an individual farmer. There are of necessity rotation crops, and usually other crops dictated by the suitability of the land, availability of markets or special skills of the grower.

As a guide to growers of diversified field and truck crops, who wish to add sugar beets to their programs, Table II has been prepared. This table groups the customary row spacings and planting methods for the principal row crops in California.

TABLE II
ROW SPACINGS OF VARIOUS CROPS

CROP	20" to 24"		26" to 34"		40" to 42" Beds		OTHER
	FLAT	BEDS	FLAT	BEDS	SINGLE ROW	DOUBLE ROW	
Beets (Table or Sugar)	X	X	X	X		X	
Beans (Pink, white, etc.)	X		X	X		X	
Broccoli	X					X	
Cabbage			X	X		X	
Carrots	X					X	
Cauliflower			X	X	X		
Corn (Field or Sweet)				X	X		
Corn (Milo)	X					X	
Cotton					X		
Flax	X						
Garlic	X					X	
Lettuce						X	
Melons							5' - 6'
Onions	X					X	
Potatoes				X			
Safflower	X					X	
Spinach	X					X	
Tomatoes							5' - 6'

An examination of Table II reveals certain patterns which can be exploited to reduce costs of cultural operations where several crops are involved. For example, most crops may be grown on 40" to 42" beds, either single or double row. This means that all implements for tillage, listing, bed forming, planting, irrigating and cultivating can be basically identical for all of these crops.

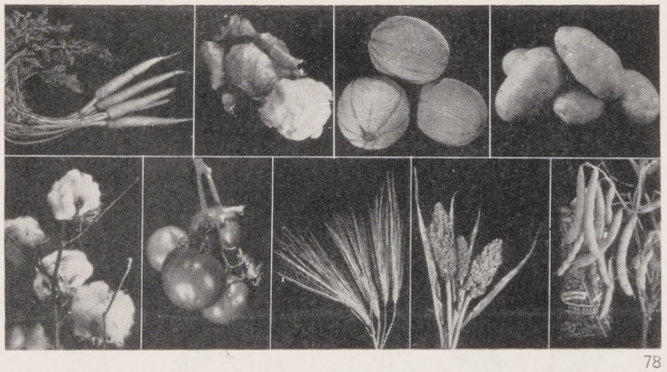
IRRIGATION SYSTEMS

A further examination of Table II shows that most of the crops grown on 40" to 42" double beds may also be grown on 20" to 24" flat plantings. The choice between flat and bed planting is determined by irrigation methods. Bed planting is the logical

(*Continued on Page 49*)

SOME FACTORS THAT DETERMINE PLANTING METHODS

THE FACTORS



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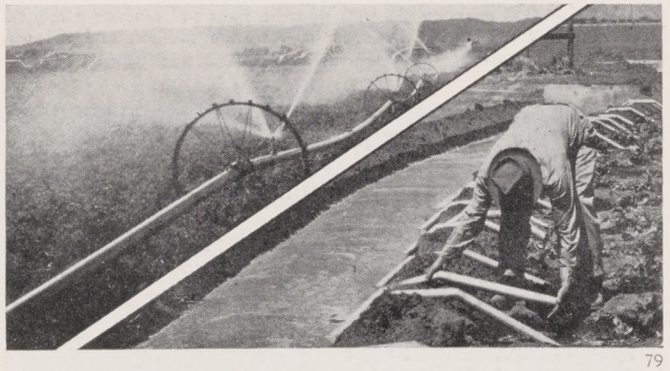
OTHER CROPS in the growers' farming program will influence the choice of beet-row spacing. These crops determine the choice of implements for tillage, seed bed forming, planting and cultivating. Beets should be planted to take advantage of this implement set-up.



79

IRRIGATION METHODS will influence the method of planting beets. Furrow irrigation calls for bed planting, either single or double row. Sprinkling, subbing, or a combination of both, call for planting on a flat seed bed, with row spacing determined by other factors.

80

HARVESTING METHODS have an important bearing on the choice of row spacing. Single row harvesters demand evenly spaced rows, 22" to 30" apart. Double row harvesters (grower or contractor operated) do their best work on odd spacing such as 16" - 26" double row beds.

THE METHODS

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FLAT PLANTING should be used if irrigation is to be by sprinkling, subbing or a combination of both. It is not recommended for irrigation by flooding, but is satisfactory if a good furrowing job is done after thinning. It does not permit irrigating for germination after planting.

82

SINGLE ROW BEDS fit in well with crops like beans, corn, potatoes or other crops requiring furrow irrigation and row spacings from 26" to 34". They fit single row harvesters best if spaced from 26" to 30". Close plant spacing in the row is essential for high yields.

83

DOUBLE ROW BEDS are the favorite because so many other crops are similarly planted. They produce some of the best beet yields, and are best suited to double row harvesters. Harvesting contractors do their best work on double row beds, preferably 16" - 24" to 16" - 28".

PROPER CARE OF PLANTERS WILL IMPROVE STANDS

By JOHN O. NIELSEN
Assistant District Engineer, Spreckels Sugar Company

THE TIME of year is drawing near when sugar beet planters should be made ready for their season's work. A general checking over and overhaul will help to eliminate costly breakdowns, time lost in the field, and will aid greatly in securing a good stand. The following steps are suggested as a guide for servicing the planters in most general use by California beet growers (John Deere 18, 55, and 66, McCormick-Deering 42, and Planet Jr.)

CLEANUP AND INSPECTION (All planters)

Clean grease, dirt and trash from all moving parts.

Inspect framework for cracked, broken, or bent parts, loose or missing bolts, nuts, set screws, cotters, etc.

Check for missing accessories such as depth bands, hopper lids, markers, etc. that may have been misplaced during the past season.

SEED HOPPERS (John Deere & McCormick-Deering)

Completely disassemble, taking careful note of cut-off and knocker parts, so as to re-assemble correctly. Clean off all rust and residue from seed plate, false plate, knocker wheel, cut-off pawls, springs, cap, hopper bottom, etc. A wire wheel buffer does a good job. Re-assemble and lubricate freely with powdered graphite. **Do not use oil or grease in seed hoppers.** Turn seed plate several revolutions by hand to see that there is no binding, and be sure that knocker wheel rides in the seed celis. Slipping or broken drive chains are sometimes the result of binding seed hopper parts.

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ALL WORKING parts of plate-planter hoppers should be wire-brushed. This removes rust, assists seed flow, and cuts friction to a minimum.

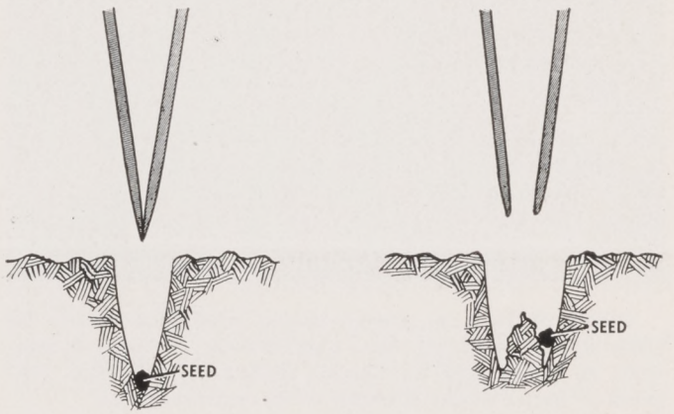
Use correct size seed plates. It is recommended that the cell hole size be at least .180″ diameter (No. 15 drill size) for processed beet seed graded 7 to 10/64″. 12/64″ holes (.1875″) are also satisfactory. Holes should be reamed to size from the bottom side with a tapered reamer, and not drilled.

SEED HOPPERS (Planet Jr.)

They require little maintenance other than cleaning up and replacing lost or damaged parts. Check agitator drive shaft for wear and alignment where it passes through hopper bottom. With hopper clamped in place, turn drive wheel over by hand to see that shaft is free and gears properly meshed. A "frozen" shaft can be freed with diesel fuel.

FURROW OPENERS (Double Disk)

Double disk openers require close attention to maintain proper planting depth and seed distribution. Check for excessive wear and warping. Worn disks will gap at the leading edge and not cut a clean V-shaped furrow. Trash and dirt are likely to be picked up between the disks until they become clogged.



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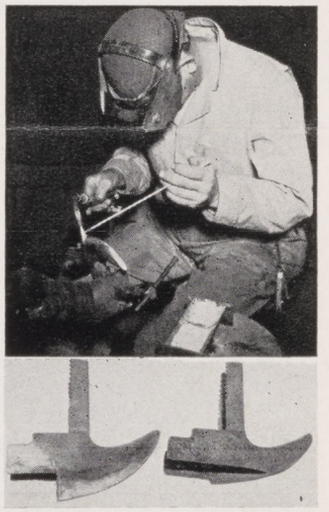
LEFT — Sharp opener disks in close contact will produce a clean-sided furrow permitting the seed to lodge firmly at the bottom.

RIGHT — Dull opener disks with worn bearings will produce a ragged "W" shaped furrow, with the seed off-row, too shallow, and in poor contact with the soil.

Some wear on John Deere disks can be compensated for by removing paper shim washers between bearing block and boots. McCormick-Deering disks can be adjusted by tightening spreader on inside scraper.

Entire unit should be taken apart for cleaning and inspection. Be sure seed boot and tube is clear of old seed and cobwebs. Remove rust and dirt from disks—sharpen if necessary. Check for loose hubs (often indicated by leaking grease). On McCormick-Deering planters, run a small wire through grease tubes in boot to see they are clear, and check for lost or bent seed deflectors. After re-assembling unit, grease bearings and see that disks turn freely. Be sure threaded plug that holds disk to boot is tight.



86

ABOVE — Hardfacing runner openers saves dollars in replacement and will improve emergence.

BELOW — The hardfaced opener on the left planted as many acres as the untreated opener on the right.

RUNNER OPENERS (All planters)

Runner or shoe type furrow openers should be reasonably sharp and smooth on cutting edge to prevent picking up trash. Hard-facing is recommended for abras-

ive soils, but finished surface must be smooth. Make sure seed drops are open and adjust all runners to uniform depth.

PRESS WHEELS (All planters)

Press or packer wheels must roll easily. Check for clogged grease fittings or oil holes. Replace worn bushings and collars. Look for worn out or missing scrapers and adjust scraper to barely clear the wheel.

CLUTCH, DRIVE CHAINS, SPROCKETS & GEARS (John Deere & McCormick-Deering)

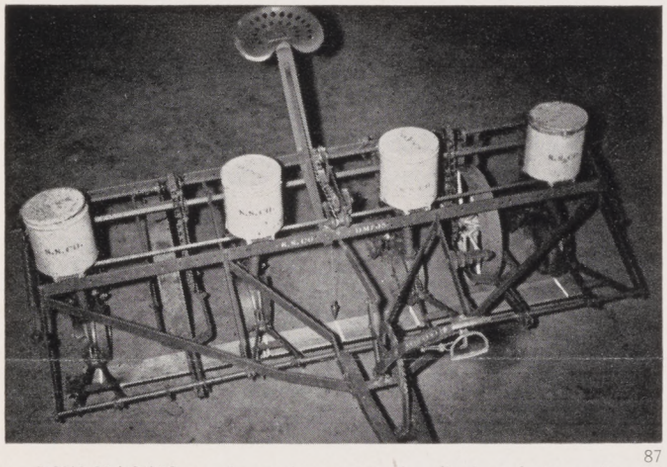
Examine ratchets for excessive wear. Throw-out cams on John Deere clutches should be replaced if worn enough to fail to completely disengage clutch. Check for sufficient spring tension or worn teeth if clutch slips when engaged. McCormick-Deering clutch trouble can develop if there is a worn pin in shifter shaft or if the power lift arm is loose or bent.

All drive chains and sprockets should be in alignment and proper tension maintained. **Note:** Steel chain should be put on sprockets with the hook forward in direction of travel, and slot to outside.

See that all gears are in mesh and turn freely without binding. Particular attention should be given to hopper drive pinion and bevel gears. Slippage of these gears will cause "skips" in planting.

SETTING UP AND ADJUSTING (All planters)

Set row spacing accurately (within 1/4"). Lay out row spacing on a board or level floor and locate units equally distant from center of planter. Be



87

ROW-SPACING can be made accurate by aligning planter units and planter center (plumb bob) with white chalk lines properly spaced on a board. A few minutes of careful adjustment will save hours and dollars during cultivating and harvest.

sure openers are parallel to line of travel and clamped or bolted tightly in place. Set for desired seeding rate and make short test run for final check and adjustments. A "grease board" test is the most accurate way to check seed distribution.

GENERAL PRECAUTIONS (All planters)

Lubricate daily.

Clean out seed hoppers at least twice a day. A little graphite sprinkled in with the seed occasionally will help to keep hopper parts working freely.

Drive at steady rate—not over 3 MPH.

Do not back up with furrow openers in ground.

Recheck row spacing after transporting planter.

THE SPRECKELS SUGAR BEET BREEDING PROGRAM

By DR. RUSSELL T. JOHNSON
Plant Breeder, Spreckels Sugar Company

THIS IS a review of the projects under way in Spreckels Sugar Company's plant breeding program. This program is being conducted in an attempt to develop more desirable varieties of sugar beets for those areas of California in which Spreckels Sugar Company contracts sugar beet acreage.

In the past year some important equipment has been added to Spreckels Sugar Company's plant breeding facilities. The principal additions have been a new greenhouse and a refrigerated chamber for storage of beets selected as "mother beets" to be used in further breeding work.

Because beets need a period of cool weather before they will produce seed stalks, the installation of the cold chamber has greatly aided Spreckels' plant breeding efforts. It is no longer necessary to wait for a winter to make selected beets produce seed. At any desired time they can be placed in the cold chamber at temperatures from 38° to 44° F. for a certain length of time, then moved into the greenhouse where they will complete their reproductive phase and produce seed.

In the past season, seven experimental varieties have been produced and will be tested next year. Four of these are open pollinated varieties produced in an attempt to maintain the high yielding ability of the material from which they were produced, and at the same time increase the sugar percentage.

The other three varieties produced are hybrids. The "female" or seed parent common to all three of these hybrids was a strain developed and supplied by the U. S. Department of Agriculture. It possessed the highly desirable qualities of being male sterile, (produced no pollen) and producing entirely single germ seed. The 'male' or pollen parents of the three hybrids were three of Spreckels' own varieties. The purpose of producing these three hybrids was twofold. One was to obtain enough single germ seed to conduct some mechanical tests to determine what processing will be necessary with single germ seed and how it can best be planted and thinned. The other reason was to study the growth of the hybrids in the field in order to determine the ability of this single germ parent to transmit desirable characteristics to its hybrid offspring.

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THESE ARE flower buds of a single germ hybrid. Each bud is separate, and will produce a single germ seed instead of the normal multi-germ cluster.

(Continued on Page 50)

EARLY PLANTING OF SUGAR BEETS OFFERS MANY ADVANTAGES

IN THE CENTRAL VALLEYS

By HARRY J. VENNING
Assistant District Manager, Spreckels Sugar Company

PLANTING dates which are considered normal in the Salinas, San Benito and Santa Clara Valleys strike the grower in the Sacramento or San Joaquin Valley as being unusually early. This different attitude is hardly justified by climatic differences — in fact some of our Central Valley areas could and should be planted earlier than some of the coastal areas.

Growers in the Central Valleys have been heard to say, "My late planted beets always get off to a good start, never stop growing, and seem to get ahead of the earlier plantings which may have gone dormant for a while." If the real facts could be learned, it is probable that the late planted beets would rarely, if ever, catch up to the early plantings. Besides the somewhat greater yield of the early plantings, there are so many other advantages that any grower should critically examine the fancied "advantages" of late planting (March 15 or later).

A few of the good reasons for anticipating an early planting program are here listed:

1. Early seedbed preparation permits planting during the first "break" in the weather. There is no completely predictable dry spell during January or February. But past records show that a two-week rainless period during these two months is almost sure to occur. This dry spell can be used for planting if the seedbed has been prepared.

2. Early planting makes use of thinning labor which is readily available early in spring—but which becomes critically scarce as the season advances. This is no news to many growers who had beets to thin last May and June—some growers found labor almost unobtainable, and the beets were too large for mechanical thinning.

3. A longer growing period means higher sugar percentage. The tendency in the last few years has been for tonnage yields to increase, but sugar percentages to be slightly depressed. While heavy nitrogen applications have built up these tonnage yields, the crop requires more time to fully utilize the nitrogen and start storing sugar in the roots.

4. Early planting permits mechanical harvest before the rainy season begins. California's harvest would be nearly 100% mechanical were it not for the late fall rains that drive the machines from the fields. If the crop is planted early, it matures early, and economies of mechanical harvest are not threatened by the possibility of rains.

IN THE COASTAL VALLEYS

By R. S. LAMBDIN
Assistant District Manager, Spreckels Sugar Company

AS PLANTING time approaches our thoughts turn to the problems involved and to some of the practices which are responsible for maximum sugar production.

One practice which has been partly responsible for securing maximum yields is early planting. In the Salinas area early planting has been customary for a number of years, and the yields in this area demonstrate its value. This district has averaged 20.1 tons per acre for the past five years, a very good record for any district.

We have checked through the records and it is of interest to tabulate the percentage of acreage planted during the period which we consider early. We assume that all plantings made prior to March 1st are early. The following table will show how many of the growers do actually get their plantings made during this early period.

PERCENTAGE OF TOTAL ACREAGE PLANTED EARLY

	Planting Period Ending		
YEAR	DEC. 31	JAN. 31	FEB. 28
1950	23.2	33.4	88.4
1949	8.0	24.2	60.8
1948	34.6	70.7	91.6
1947	28.5	66.6	86.6
1946	8.0	67.0	82.0
5 Year Average	20.5%	52.4%	81.9%

These figures demonstrate that by maintaining equipment in good order and planning their farm programs in advance, growers are able to take advantage of all breaks in the weather and finish planting during the early period.

Planting early has many advantages, some of which are extremely important. Two of these should be mentioned. We have a nematode problem in most of this area and early plantings along with good crop rotation is the only way known at present to combat this pest. Harvest scheduling is also very important, and early plantings take full benefit of the time needed to grow and harvest a crop of sugar beets before the rainy season starts.

In the past, growers in some of our area might have planted earlier, but were unable to because we could not furnish varieties with sufficient blight and bolting resistance for planting in districts where Curly-Top might be severe. However, we now have at our disposal seed varieties which can be planted in any of our beet growing areas during the time listed as our early planting period.

THE CONTROL OF WATER GRASS BY CULTURAL METHODS

By DAN DIETER

Field Superintendent, Spreckels Sugar Company

CONTROLLING water grass in beet fields is one of the grower's major problems. Various methods of control, both cultural and chemical, have been tried. The methods which have proved to be practical and least expensive are offered for consideration in this article.

Chemical control with materials like TCA, has met with varying degrees of success. This leaves cultural methods and practices as the most dependable and least expensive means of control.

The control of water grass can be fitted into two categories: pre-planting practices and post thinning practices.

PRE-PLANTING PRACTICES

In the North San Joaquin area, single row bed planting is predominant. This allows a greater possibility of economical and complete control than double row plantings.

Closely related to the practice of single row plantings is the factor of early planting. Early planting is desirable because the beet seedlings will have sufficient growth and strength to compete with water grass which emerges later. The larger beet plants will have sufficient leaf surface to shade the grass seedlings and retard their growth until they can be destroyed by cultivation.

Fairly wide row spacings (26″ to 30″) are important in control as the beets can be cultivated when the tops are large in June and July. Considerable labor can be saved by destroying the late weeds by mechanical means instead of by hand labor as is necessary in double rows.

In areas where later planting is practiced, or in a field where the grower has a bad infestation of water grass, the use of a pre-planting irrigation to germinate the grass has proved very successful. Under this plan the field is ridged just as it would be for planting and is then irrigated. After irrigation a period is allowed for germination of the grass seed and after this takes place the tops of the beds can be harrowed with a Swede harrow on runners or some other means to destroy the grass. Planting of the beet seed can then take place. An outstanding demonstration of this practice was the Ed Thoming field, seen on the Beet Growers' Association Tour held during August in the San Joaquin County area.

When this field was viewed by the group, it was practically free of grass and had all the prospects of making a twenty five ton crop. No additional hand work was needed after the first hoeing and properly timed cultivations kept the grass down to a few scattered individual plants throughout the field.

In summarizing pre-plant control of water grass the following practices can be listed:

1. Single row planting to allow later cultivation to destroy the late summer grass seedlings.
2. When, and where possible, early planting to allow the beets to become fully established before the emergence of the beet seedlings.
3. Pre-planting irrigation in later planted fields to germinate the grass so it can be destroyed prior to the planting of the beets.

POST-THINNING PRACTICES

Post-thinning control consists of a well timed program of cultivation. This practice will do a great deal to reduce hand labor costs.

The use of such tools as the Peters "Byhoe" or the rotary "Cultro" prior to thinning will result in closer cultivation. The beets will be left in such a narrow band at thinning times that a superior job of thinning and hoeing can be accomplished.

After thinning time when the stand is established and the beets have sufficient size, numerous cultivations, properly timed with the irrigations, will destroy the seedling grass plants and give a good control. As the beets increase in size, the depth of the furrows can be increased and the excess dirt thrown toward the beets to cover any grass in the rows.

In summarizing the recommendations for control after thinning, it is realized that numerous questions and arguments can be raised by growers in regard to some of the practices mentioned. Some growers may feel that certain practices will not fit in with individual areas or farming practices. The fact remains that water grass has become a serious menace to row crop farming and some changes in beet growing practices may be necessary to secure a control if beets are to be raised economically in grass infested land.

HOW SHALL I PLANT MY BEETS?

(Continued from Page 44)

choice if furrow irrigation is to be used. Flat planting can be used if irrigation is to be by rain machine, subbing, or a combination of these two.

Flat planting in anticipation of surface irrigation by flooding (with or without checks) is becoming an obsolete practice for all row crops, and is not recommended for sugar beets.

HARVESTING METHODS

Hand harvesting can be used with sugar beets on any row spacing, and is therefore not a determinant of row spacing. But hand harvesting accounts for less than 30% of California's beet acreage, so that most growers are obliged to plant their beets in anticipation of machine harvest.

The key to row-spacing as determined by harvesting methods lies in these simple statements:

Owners of single row harvesters will plant evenly-spaced rows spaced from 20″ to 32″ apart.

Owners of double-row harvesters will plant either 20″ evenly spaced rows or double rows on beds, spaced between 12″ and 16″.

Growers who own no harvesters, but contemplate contract harvest, either by hand or machine, should plant either 20″ evenly spaced rows or double rows on beds, spaced between 12″ and 16″. (Nearly all machine harvesting contractors use two-row machines, which do their best work on 40″ or 42″ double beds, with rows spaced 14″ on the beds.)

BREEDING PROGRAM

(Continued from Page 47)

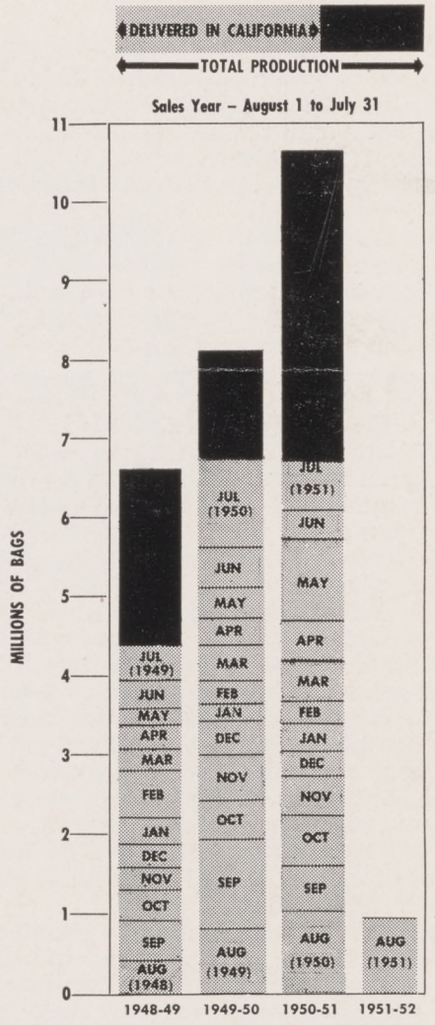
Recently two more projects have been incorporated into Spreckels' plant breeding program. These relate to varieties able to germinate at low temperatures, and varieties having root shapes best suited to mechanical harvest.

Tests were conducted at our laboratory with all the commercial varieties available to determine how rapidly the different varieties germinated at low temperatures. There were considerable differences between varieties in the length of time required to germinate when the temperature was maintained at 45° F. This was of real interest because it would seem reasonable that if a seed were able to germinate and emerge through the soil rapidly, even at the relatively cold temperatures which often occur during early plantings, the grower would be much more sure of a satisfactory stand. The period between germination and emergence of a beet seedling is when many soil inhabiting, parasitic fungus organisms are able to attack the young seedling, and in many cases actually kill it before it emerges. Therefore anything that would reduce the time it takes for emergence should be of benefit in improving the stand. On this assumption selections were made of those seedlings in Spreckels variety, S-2, which germinated most rapidly at 42° F. Those selected seedlings were transplanted to pots and will be induced to produce seed in the greenhouse this winter. Tests will be made on that seed in comparison with other varieties to determine what progress has been made toward developing a variety that will grow more rapidly at cold temperature.

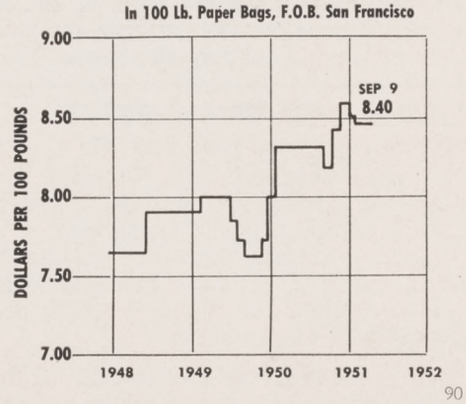
As more and more of the sugar beet acreage is being harvested by mechanical harvesters it would seem desirable to somewhat alter the shape of the root to a shape more adaptable to mechanical harvest. An attempt is now under way to develop a beet which is more cylindrical than our present varieties. Most of our commercial varieties are almost conical in shape. In a heavy crop of large beets, especially in hard, dry ground, a lot of the tails are broken off at a point where the beets are two or three inches in diameter. The portion broken off is left in the ground and is not recovered. If a variety of beets can be developed which is more cylindrical in shape without sacrificing any total root weight, it is quite possible that a larger portion of the crop could be recovered by a mechanical harvester.

In addition, to the program described above, a continuous effort is being made to develop and maintain disease resistant varieties for those areas in which specific disease problems are present.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR



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Mention of specific methods, devices or implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.
AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

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AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

SPRECKELS SUGAR COMPANY

Incorporated August 6, 1897

Two Pine Street

San Francisco 11, California

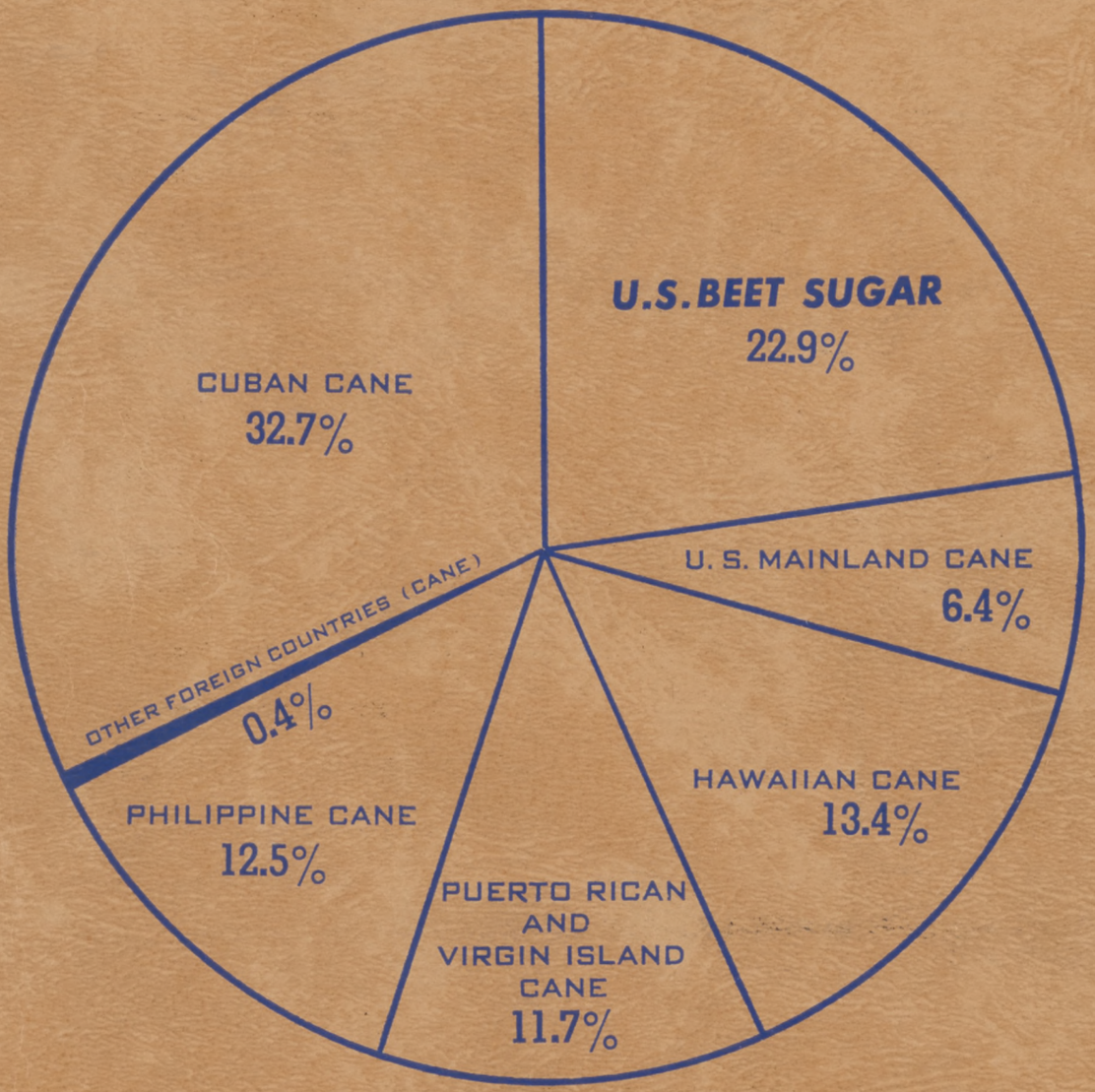
Authorized Capital Stock	$12,500,000.00
Capital Stock Outstanding	9,000,000.00

C. J. Moroney	President and Director
H. Beach Carpenter	Director
Charles de Bretteville	Director
Roland C. Foerster	Director
Carl F. Huttlinger	Director
Joseph W. Mooney	Director
G. Vincent Pach	Director
John N. Rosekrans	Director
Brayton Wilbur	Director
Wharton K. Gray	Vice President
Bert K. Henry	Vice President and Treasurer
William H. Ottey	Vice President and Sales Manager
E. H. Kellberg	Secretary and Ass't Treasurer
Guy D. Manuel	General Agriculturist

SPRECKELS SUGAR COMPANY FACTORIES

	SPRECKELS CALIFORNIA	MANTECA CALIFORNIA	WOODLAND CALIFORNIA
			
Erected	1899	1917	1937
Superintendent	E. M. Hartmann	A. A. Norman	Ira A. Resch

WHO SUPPLIES THE NATION'S SUGAR?



STATUTORY QUOTAS UNDER SUGAR ACT OF 1948, WITH CONSUMPTION ESTIMATE OF 7,850,000 TONS, RAW VALUE